Non-Technical Summary

MarramWind Offshore Wind Farm

December 2025

MarramWind

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Contents

1. Introduction

1.1 Purpose of this Non-Technical Summary

1.1.1.1 This Non-Technical Summary (NTS) presents an overview of the MarramWind Offshore Wind Farm, (hereafter, referred to as 'the Project'). It summarises the environmental assessments that have been carried out for the Project, which are detailed in the full Environmental Impact Assessment (EIA) Report.

1.1.1.2 The purpose of this document is to present the key environmental issues associated with the Project in clear, non-technical language. It is designed to be read as a stand-alone summary, enabling anyone to understand how the Project could affect the environment, without needing to refer to the full EIA Report. For anyone seeking more detailed information on specific topics or issues, please refer to **Volumes 1** to **Volume 4** of the complete EIA Report, which are publicly available on the websites of Aberdeenshire Council and the Marine Directorate.

1.1.1.3 This NTS includes a description of the Project, an overview of the consultation process, and a summary of the EIA work undertaken. **Table 1.1** provides a guide to the sections within this document, helping readers quickly locate topics of particular interest.

Table 1.1 What's included?

Section	What it is about
1. Introduction	The remainder of this Section introduces what the Project is and where it is located. An introduction is also given to the company that is applying for consent to build the wind farm. This is MarramWind Limited, or 'the Applicant'.
2. Site selection and alternatives	This Section summarises how the Project design has evolved over time and what alternatives have been considered.
3. Project description	This Section describes the main component parts of the Project explaining how the Project will be built and how long construction will take.
4. Approach to the EIA	The EIA has to be produced to inform planning decisions on whether the Project should get consent or not. The EIA presents the findings of a range of environmental assessments that have been undertaken to show the impact that the Project could have on the environment. These are usually referred to as environmental impact assessments, or EIA. The approach to doing the assessments is agreed with the regulators in advance. This Section explains how this was agreed, how the assessments have been undertaken and how these have been informed by legally required consultation and additional stakeholder engagement.

Section	What it is about
5. Offshore environmental assessment	This Section provides a summary of what the environmental assessments found in relation to impacts on the marine environment. For each of the offshore environmental topics, the Section provides: • an overview of how the environmental impacts have been assessed; • a description of the existing environment; • an overview of environmental measures or actions taken to protect the environment. These are intended to avoid, prevent, reduce or, if possible, offset the impacts identified as a result of the Project.
6. Onshore environmental assessment	This Section provides a summary of what the environmental assessments found in relation to impacts on the terrestrial environment. For each of the onshore environmental topics, the Section provides: • an overview of how the environmental effects have been assessed; • a description of the existing environment; • an overview of environmental measures or actions taken to avoid, prevent, reduce or, if possible, offset impacts identified as a result of the Project.
7. Whole-project environmental assessment	Some impacts are not specific to the offshore or onshore environments. Instead, they relate to the Project and its surrounding environment as a whole. This Section provides a summary of what the environmental assessments found in relation to whole-project issues. For each of the whole-project environmental topics, the Section provides: • an overview of how the environmental effects have been assessed; • a description of the existing environment; • an overview of environmental measures or actions to avoid, prevent, reduce or, if possible, offset any impacts identified as a result of the Project.

1.2 Overview of the Project

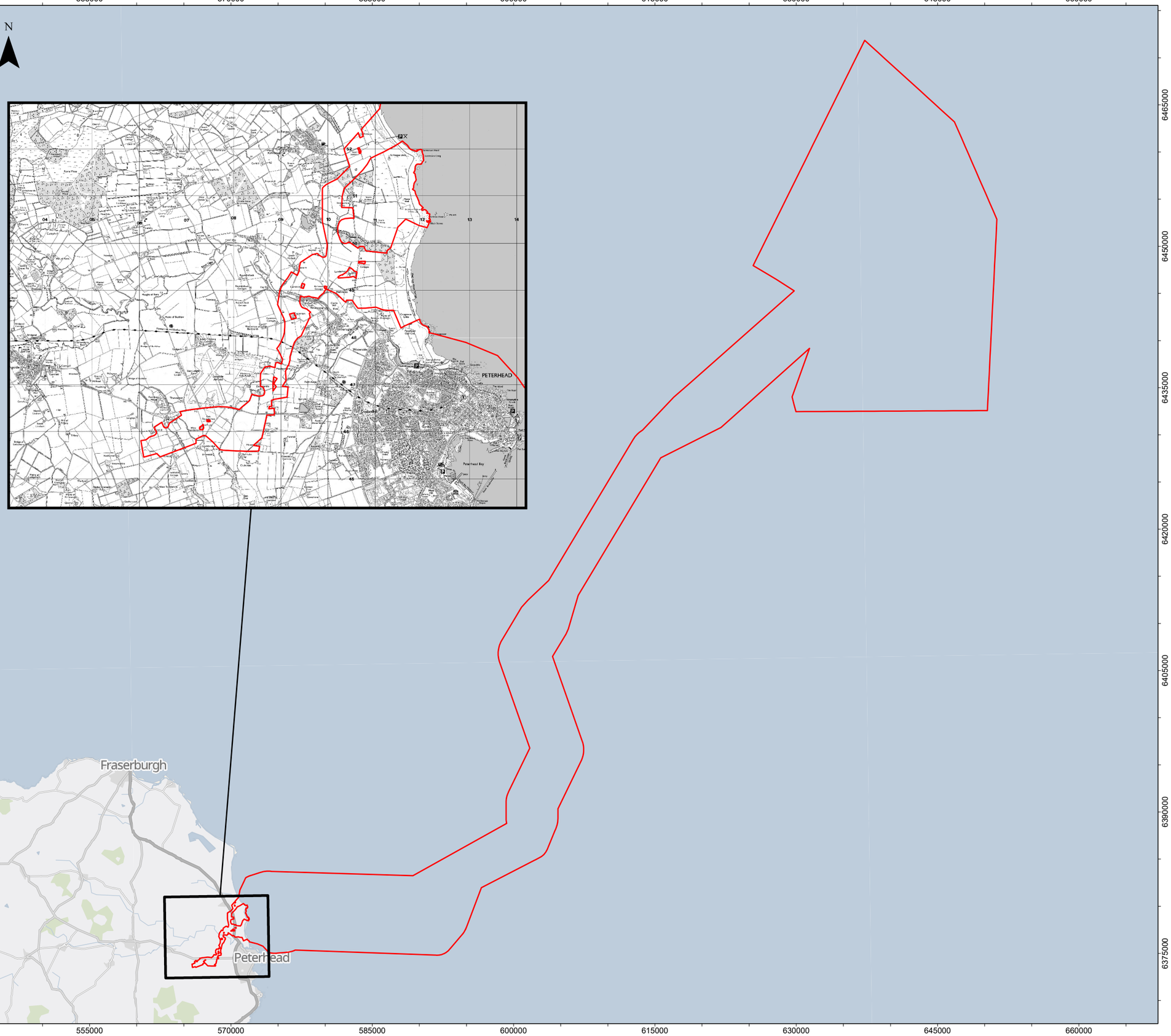
1.2.1.1 The Project is a proposed renewable energy project that will generate electricity from wind out at sea. The wind farm will be located in the North Sea, off the northeast coast of Scotland, and will use large floating wind turbines to capture the power of the wind.

1.2.1.2 The Project is being developed by MarramWind Limited, a company wholly owned by ScottishPower Renewables. The wind farm will be built far from the shore, between 75 and 110 kilometres (km) from the Aberdeenshire coast. The electricity produced by the wind

farm will connect to the electricity grid at Scottish and Southern Electricity Networks' (SSEN) Netherton Hub at Longside near Peterhead, Aberdeenshire.

1.2.1.3 Once complete, the Project will be able to provide enough clean electricity to power the equivalent of 3.5 million homes. The Project is part of Scotland's and the UK's efforts to reduce carbon emissions, tackle climate change, and create new jobs and investment in local communities.

1.2.1.4 **Figure 1** shows the location of the Project and the Project's Red Line Boundary, which is the limit on a map around the areas that could be used by the Project.



Red Line Boundary

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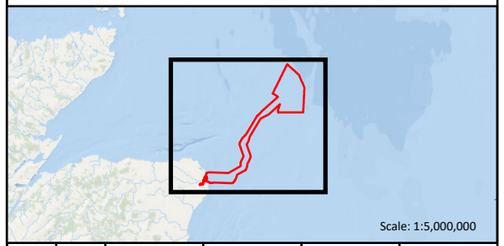

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PROJECT TITLE
MarramWind Offshore Wind Farm

DRAWING TITLE
Figure 1 Red Line Boundary

Environmental Impact Assessment Report
Non-Technical Summary

NOT TO BE USED FOR NAVIGATION

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1.2.1.5 The Project's offshore infrastructure is located on the seaward side of the average high tide line, which is referred to as mean high water springs (MHWS). The offshore infrastructure may include the following:

- **Wind turbine generators (WTGs):** These are the large windmill structures that convert wind energy into electricity. The WTGs are each fixed onto an individual floating unit, which is secured to the seabed and held stable and in place by very strong mooring lines and anchors (i.e. the station keeping system).
- **Array cables:** These are the underwater cables that link the WTGs together in a network and connect them to offshore substations. They carry the electricity generated by each turbine to a central point for further processing.
- **Subsea distribution centres (SDC):** These are underwater hubs on the seabed that help route the electricity from multiple WTGs to the substations. They act like junction boxes, organising the flow of power efficiently.
- **Subsea substations:** Located on the seabed, these facilities change the voltage of the electricity so it can travel longer distances along subsea cables without losing power.
- **Offshore substations:** These are larger platforms above the sea that collect electricity from many WTGs and prepare it for export to the national grid on land. They are essential points in the system where the power produced is managed and monitored.
- **Reactive compensation platform(s) (RCPs):** These specialised platforms above the sea help to maintain the quality and stability of electricity as it travels through very long cables. They ensure voltage remains steady so the power supply is reliable.
- **Offshore export cables:** These are the main transmission cables that carry electricity from the offshore substations all the way to the landfall points at the coast, where it enters the national grid.

1.2.1.6 The Project's onshore infrastructure is located on the landward side of the average low tide line, which is referred to as mean low water springs (MLWS). The onshore infrastructure may include the following:

- **Landfall(s):** This is the place where the offshore cables come to shore. Here, the cables transition from under the sea to underground routes on land.
- **Underground onshore export cables:** These cables run beneath the ground from the landfall points to the onshore substations. They carry electricity inland for processing.
- **Onshore substations:** These large electrical facilities will be located together on one site. They increase the voltage of the electricity and prepare it for transmission to the grid.
- **Underground grid connection cables:** These underground cables link the onshore substations to the national grid connection point at SSEN's Netherton Hub. These ensure the electricity reaches the national network so that the power can go to people's homes and businesses.
- **Grid tie-in:** This is the final electrical connection of the Project to SSEN's substation at the Netherton Hub. This step is part of a separate project and is not included in this consent application.

1.2.1.7 Given the scale of the Project, the construction and start-up of the WTGs will happen over three phases. Each phase of the Project will be operational for up to 35 years from when the WTGs are commissioned, which is the process of testing and starting up the WTGs so they work properly and produce electricity.

1.2.1.8 You can find more information about the Project in **Section 3** of this NTS and in **Volume 1, Chapter 4: Project Description** of the EIA Report.

1.3 Who is developing the Project?

1.3.1.1 MarramWind Limited is the company that is leading the development of the Project. MarramWind Limited is 'the Applicant' for the necessary consents and permissions, and is a company wholly owned by ScottishPower Renewables (SPR).

1.3.1.2 SPR is part of the ScottishPower group of companies, operating in the UK under the Iberdrola Group, and is a leading UK renewables developer with over 40 operational wind farms generating 3 gigawatts (GW) of green energy. ScottishPower is the first integrated energy company to generate 100% green electricity in the UK. Focused on wind energy, smart grids and driving the change to a greener future, ScottishPower is investing £24bn to 2028 on renewable power and transmission and distribution grids.

1.3.1.3 Iberdrola Group is a world leader in the development of offshore wind energy, with five operational wind farms and four major projects under construction. With a committed investment of €8bn from 2025 to 2028, this will give 5.7GW of installed offshore capacity by 2028. This is part of the €58bn investment plan announced in 2025 by Iberdrola, 35% of which is being invested to grow the overall installed capacity of renewable power to 60GW by 2028.

1.4 Project need

1.4.1.1 Scotland and the UK are committed to tackling climate change and reducing greenhouse gas emissions. The Project is being developed because the Scottish Government has declared a global climate emergency and set out a range of policies designed to tackle this. This includes policies that support developments that can reduce national emissions of greenhouse gases like carbon dioxide, much of which comes from burning fossil fuels like oil and gas.

1.4.1.2 To meet these goals, we need to replace fossil fuels with renewable energy sources that do not produce greenhouse gas emissions. Offshore wind is one of the most effective ways to do this because it can generate large amounts of electricity from natural wind resources far out at sea.

1.4.1.3 To achieve this, the ScotWind leasing round occurred in 2022 to allow offshore wind developers to obtain a lease to develop specific areas of seabed that were called 'Plan Options'. The seabed around Scotland is owned by the Crown and managed by Crown Estate Scotland. ScotWind was run by Crown Estate Scotland to lease these Plan Options areas of the seabed for offshore wind farm development. Developers applied for the legal rights to use specific areas, and successful applicants were awarded an "Option Agreement" for their chosen site. The Option Agreement Area, or OAA, is the specific area of seabed that a developer has secured through the ScotWind leasing process. This is where the wind farm will be planned and built, subject to further studies and permissions. The MarramWind Offshore Wind Farm is one of the projects that has emerged from the ScotWind seabed leasing process.

1.4.1.4 This Project will deliver up to 3GW of renewable electricity from Scotland's deep waters to the UK's power grid, enough to power millions of homes. By doing so, it will help meet legally binding climate targets, improve energy security, and reduce reliance on imported fuels. It will also support jobs, investment in local communities, which would include local and community socio-economic benefits and the growth of a sustainable energy industry in Scotland. The Project would also support local supply chains, ensure it creates fair

employment, provide skill and training opportunities alongside apprenticeship / work experience opportunities and ensure the local benefits provided by the Project are community led.

1.4.1.5 In short, the Project is a vital part of the national plan to cut carbon emissions, keep energy affordable and reliable, and create long-term economic benefits.

1.4.2 Policy drivers that underpin the Project need

1.4.2.1 At the international level, the Paris Agreement is a legally binding international treaty on climate change that commits the UK to ambitious greenhouse gas reductions, driving urgent decarbonisation. This commitment is embedded in national legislation, including the UK Climate Change Act 2008 and the Climate Change (Scotland) Act 2009, which set statutory targets for net zero by 2050 (UK) and 2045 (Scotland). The Climate Change (Emissions Reduction Targets) (Scotland) Act 2024 further strengthens these obligations through multi-year carbon budgets.

1.4.2.2 At the national level, Scotland has a national spatial planning strategy called the National Planning Framework 4. Under National Planning Framework 4 (Scottish Government, 2023a), strategic-scale renewable projects such as offshore wind farms and transmission infrastructure are designated as national developments. This designation confirms the principle of development at the national level.

1.4.2.3 Scotland has a National Marine Plan that creates a framework for how the seas of Scotland are managed. It includes policies that promote the sustainable development of offshore wind in Scottish waters and that are intended to maximise the economic benefits of these projects for Scotland.

1.4.2.4 Under the National Plan, there are plans that relate to specific industrial sectors, one of which is for offshore wind. The Sectoral Marine Plan for Offshore Wind Energy (Scottish Government, 2020a) and its Draft Updated version (Scottish Government, 2025) identified the Northeast 7 (NE7) Plan Option Area as a sustainable location for commercial-scale offshore wind development. The retention of NE7 in the updated plan confirms both the national need and the suitability of this site for the Project. The grid connection location at the SSEN Netherton Hub has been determined through strategic planning led by the National Electricity System Operator (NESO), including the Holistic Network Design (NESO, 2022) and Beyond 2030 (NESO, 2024) reports.

1.4.2.5 Aberdeenshire Council also has a Local Development Plan that directs how decisions are made in relation to land uses and planning applications. It includes policies that support renewable energy developments like the onshore parts of an offshore wind project.

1.4.2.6 The UK Government has a target for the offshore wind industry to create between 43GW to 50GW of offshore wind power by 2030 and up to 89GW by 2035, as set out in the Clean Power 2030 Action Plan (Department for Energy Security and Net Zero, 2024). The Scottish Government currently has an ambition for between 8-11GW of offshore wind capacity by 2030. In June 2025, they consulted on raising this ambition to be 40GW of new offshore wind capacity by 2040, demonstrating the ongoing and evolving importance of offshore wind development and the growing importance the Scottish Government is placing upon it.

1.4.2.7 The Scottish Government also has ambitions for offshore wind power production, as outlined in the Offshore Wind Policy Statement (Scottish Government, 2020b) and Draft Energy Strategy and Just Transition Plan (Scottish Government, 2023b). By generating clean, renewable electricity, the Project will reduce reliance on imported hydrocarbons, enhance energy security, and help shield Scotland and the UK from global market volatility. It will also deliver wide-ranging socio-economic benefits, including supply chain development, local employment, and community investment.

1.4.2.8 In summary, the need for the Project is firmly established through robust policy and legislative frameworks, strategic marine planning, and the urgent requirement for decarbonisation and energy security. Its integrated offshore and onshore elements will deliver national benefit, supporting climate targets, energy resilience, and sustainable economic growth for Scotland and the UK. The Project's offshore and onshore components are therefore critical to meeting the legally binding climate and energy targets set by the UK and Scottish Government.

1.5 Consenting process

1.5.1.1 Before construction can begin, the Project needs official permission for both its offshore and onshore parts. These permissions come through separate processes:

1.5.1.2 For the offshore infrastructure (i.e. everything at sea, seaward of MHWS), the Applicant is applying for Section 36 consent (permission under the Electricity Act 1989 to build and operate an electricity-generating station) and marine licences (legal approvals for activities in the marine environment) from the Marine Directorate – Licensing Operations Team (MD-LOT). These approvals cover building and operating wind turbines and cables in the marine environment.

1.5.1.3 For the onshore infrastructure (everything on land, landward of MLWS), the Applicant will submit a Planning Permission in Principle (PPiP) (initial planning approval under Scottish planning law for the general concept of development) application to Aberdeenshire Council. This covers the landfall points, underground cables, and substations.

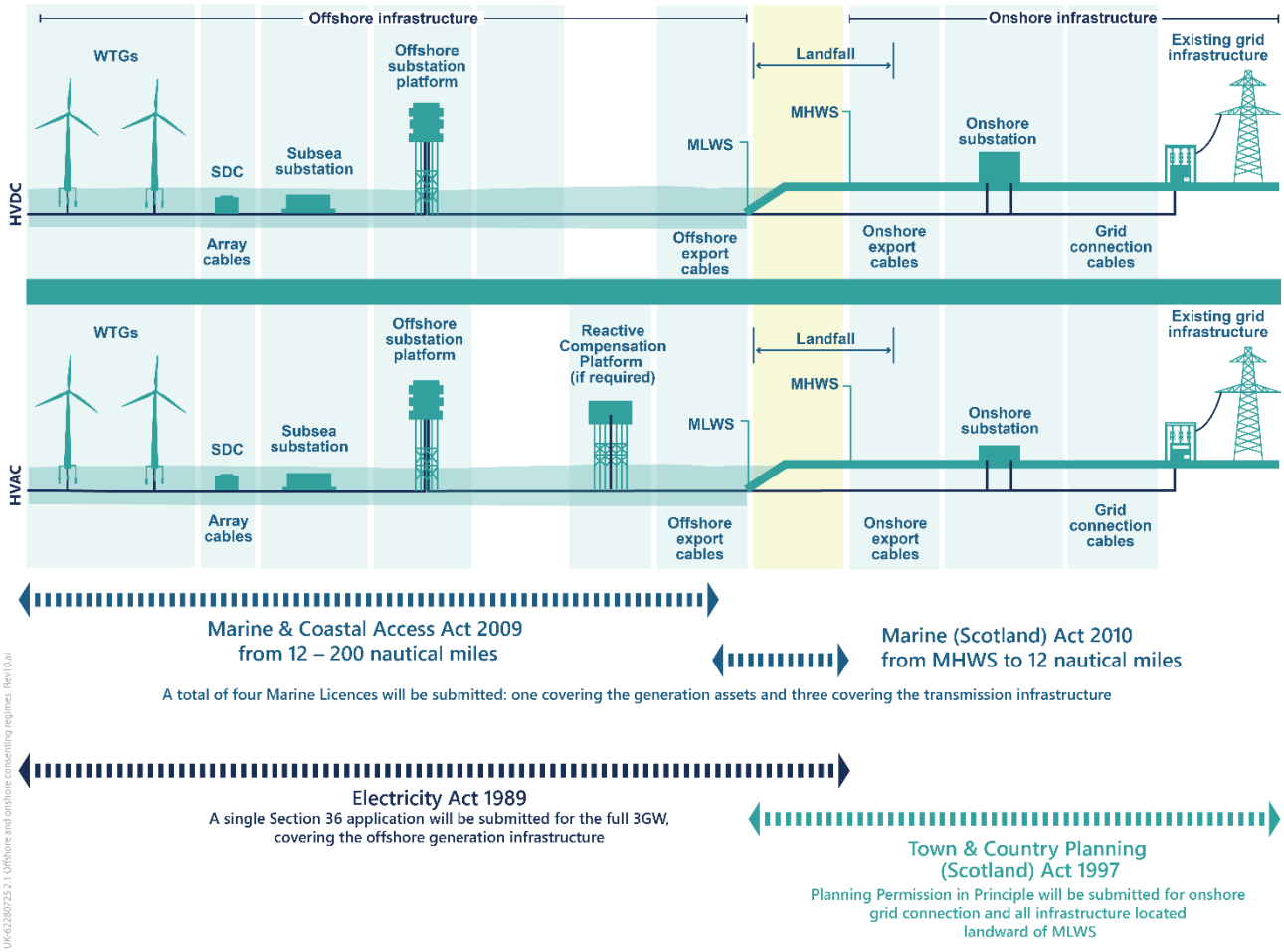
1.5.1.4 The intertidal zone (i.e. the area between high and low tide marks) overlaps the land and sea, so there is overlap between the two processes and infrastructure in this location has to be included in both the offshore and onshore applications.

1.5.1.5 The key consents, licences and permissions that are required to construct and operate the Project include:

- Electricity generating station consent under Section 36 of the Electricity Act 1989;
- Marine licences under the Marine and Coastal Access Act 2009 (between 12 nautical miles (nm) and 200nm);
- Marine licences under the Marine (Scotland) Act 2010 (between 0nm and 12nm); and
- Planning Permission in Principle under the Town and Country Planning (Scotland) Act 1997.

1.5.1.6 The diagram in **Plate 1** below shows how these consenting regimes fit together.

Plate 1 Offshore and onshore consenting regimes



1.5.1.7 The applications are accompanied by an EIA Report in accordance with the following sets of applicable Environmental Impact Assessment Regulations (hereafter referred to as the EIA Regulations):

- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017;
- The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017;
- The Marine Works (Environmental Impact Assessment) Regulations 2007; and
- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

1.5.1.8 In line with the EIA Regulations, an EIA Scoping exercise was carried out in 2022 to identify the environmental topics that needed to be studied. This led to the submission of a Scoping Report to MD-LOT and Aberdeenshire Council in January 2023.

1.5.1.9 As the planning authorities for the onshore and offshore parts of the Project, Aberdeenshire Council and MD-LOT reviewed the report and respectively issued formal Scoping Opinions in March 2023 (Aberdeenshire Council 2023) and May 2023 (Scottish Government, 2023c). These Scoping Opinions set out what the EIA should cover, ensuring the assessment is

comprehensive but proportionate (focused on the key issues without adding unnecessary detail).

1.5.1.10 Aberdeenshire Council also provided a Pre-application Advice Report in December 2024. That report gave early guidance on the planning application, including advice on what information should be included, how to address key issues, and how to meet policy requirements. The Project has taken this advice into account when preparing this application for planning consent.

1.5.1.11 Throughout this process, the Project has carried out statutory consultation and stakeholder engagement, in places going beyond legal requirements to maximise transparency. More details are provided in **Section 4.2**.

1.5.1.12 The consenting and EIA process is described in further detail in **Volume 1, Chapter 5: Approach to the EIA** of the EIA Report. The EIA Report has been prepared to enable stakeholders, including statutory consultees, members of the public and other interested parties to develop an informed view of the likely significant effects of the Project.

2. Site Selection and Alternatives

2.1 Introduction

2.1.1.1 The Project's site selection and design evolution process has been a fundamental part of the EIA. This process refers to how the design has changed and improved over time. It has been an iterative process, which means that it has progressed step-by-step, with refinements made at each stage and new information fed back into the process to better inform all the decisions that are being made.

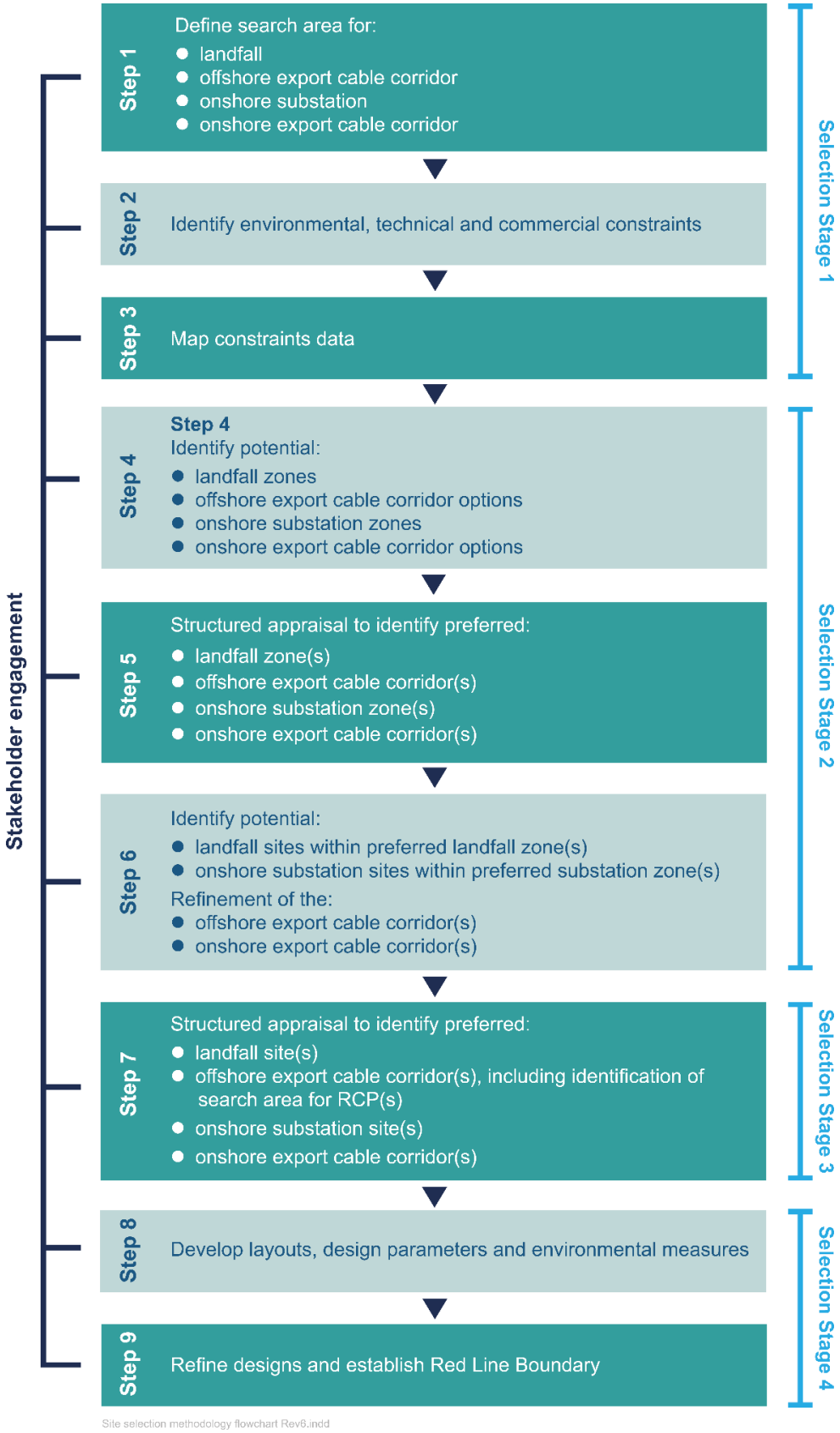
2.1.1.2 This process has been guided by detailed specialist engineering, environmental assessment and engagement with local people and interest groups, regulatory stakeholders non-governmental environmental organisations, and relevant industry representatives like commercial fisheries groups.

2.1.1.3 **Volume 1, Chapter 3: Site Selection and Consideration of Alternatives** of the EIA Report describes the reasonable alternatives (such as other possible locations, structural designs or layouts that were considered and why they were ultimately not chosen) that were considered during the EIA process.

2.1.1.4 This design process created opportunities to include environmental measures (or actions to avoid or reduce harm to the environment) directly into the Project. These measures are called embedded environmental measures, and they are steps built into the design from the start rather than added later. They are treated as commitments or promises by the developer, to perform responsibly and to protect the environment. These commitments will be upheld as the Project gets built and start to operate. Examples include avoiding sensitive or vulnerable parts of the environment, such as protected species or habitats, or to using industry best practice installation techniques.

2.1.1.5 A summary of the design evolution process is shown in **Plate 2** and more details on the embedded environmental measures are provided in **Section 4.5**.

Plate 2 Optioneering and site selection sequence



2.1.1.6 The Scoping Report was based on a Scoping Boundary that was defined at an early stage of the Project. It was geographically broad and defined the area within which the Project and associated infrastructure could be located. The Project was then refined post-Scoping, taking account of Statutory Consultation feedback (formal feedback from government bodies and regulators, as required by law) received at the Scoping stage.

2.1.1.7 Further design evolution has occurred since the Scoping and during the Statutory Consultation stages. Further information on Statutory Consultation stage is provided in **Section 4.2**. Protecting the environment has been central to the design of the Project from the outset. The following activities have informed the refinement of the Project's boundaries whilst having regard to and responding to consultation responses at each stage:

- updating of constraints mapping as new environmental information became available;
- analysis of information collected from EIA surveys;
- identification of technical construction challenges;
- collaborative working with technical environmental specialists and engineers;
- detailed review of land ownership; and
- consultation and engagement with stakeholders.

2.1.1.8 This process has resulted in the refinement to the final Red Line Boundary presented in the EIA Report in relation to the offshore and onshore consent applications.

2.2 Offshore design evolution

2.2.1 Introduction

2.2.1.1 Design evolution for the offshore part of the Project included choosing an area of sea for the wind farm, designing the size and number of WTGs to produce the power and how to set them out in the sea, considering options for structures that have to be fixed to the seabed like platforms, and finding a good route for the export cable between the wind farm and the land.

2.2.2 Choosing a wind farm site

2.2.2.1 The area where the MarramWind Offshore Wind Farm is located was first identified in 2020 by the Scottish Government via the Sectoral Marine Plan in 2020 (Scottish Government, 2020a). Out of 15 possible areas around Scotland, the site in the north-east, called NE7, was selected as a good option. The boundaries of NE7 were carefully adjusted by the Scottish Government to avoid areas where there is a lot of fishing, based on feedback from people working in the fishing industry and other stakeholders.

2.2.2.2 The Applicant did early studies that compared all the Plan Options. The objective was to identify a relatively large site with the potential to produce a lot of wind power with favourable seabed conditions for ease of construction and relatively few environmental sensitivities. NE7 fit these criteria well and so was selected by the Applicant to take forward in the ScotWind leasing round.

2.2.2.3 The boundary of NE7 was subsequently secured by the Applicant as the Option Agreement Area (OAA) for the Project via ScotWind Leasing in 2022. The Applicant then developed the Project design within the NE7 OAA and undertook site selection and routing studies for infrastructure between the OAA and the coast of Aberdeenshire.

2.2.3 WTG designs and layout within the OAA

2.2.3.1 The WTGs including floating units (platforms and 'station keeping systems', which are the moorings and anchors that hold the WTGs in position or 'at station') will be located within the OAA. The total generating capacity of the offshore wind array depends upon a range of WTG specifications that have been subject to design evolution and consideration of alternatives.

2.2.3.2 The final number, size, capacity and layout of WTGs will be determined based upon further studies of the wind conditions at sea and the site conditions on the seabed. When choosing between different WTG designs available, the team is considering whether each design's environmental impacts are manageable as well as whether it fits with the Project's practical requirements.

2.2.3.3 The WTGs will be set out in a pattern that works best for the site. For example, they might be arranged in lines (turbines placed one after another), loops (turbines connected in a circular or oval shape); or in a star shape (turbines connected to a central point). In the star-shaped layout, a central power collector, called a Subsea Distribution Centre (SDC), gathers the electricity from several turbines before sending it on to the next stage.

2.2.3.4 The layout of the offshore infrastructure components within the OAA will be arranged depending on the size and number of the WTGs, how far apart they need to be, the shape of the seabed, and making sure the Project can share the sea safely with other users, such as shipping or fishing.

2.2.3.5 Offshore substations (which collect and boost the electricity from the WTGs before it is sent to shore along subsea cables) will be located within the OAA but their exact locations haven't been decided yet.

2.2.3.6 Detailed surveys have been carried out to understand the seabed in the OAA. These studies help the team plan where to put equipment and how to build safely. See **Volume 1, Chapter 6: Marine Geology, Oceanography and Physical Processes** and **Volume 3, Appendix 6.3: Marine Geology, Oceanography and Physical Processes Baseline Report** for information on these surveys and their findings of relevance to the EIA.

2.2.3.7 An active oil pipeline (the Golden Eagle to Claymore pipeline) runs through the OAA. To protect the oil pipeline from being damaged, a safety zone of 500m on each side of the pipeline has been set, and no offshore wind equipment will be placed in this area. If any cables need to cross the pipeline, this will be carefully planned and agreed with the pipeline operator through a formal crossing agreement.

Air gap

2.2.3.8 The air gap (also referred to as tip clearance) of a WTG is the distance between a turbine blade and the sea surface. The air gap is determined by the height of the tower and the length of the blades. Increasing the height of the tower introduces the need to bring the blades further away from the water which increases the engineering complexity of the structure. In addition, the air gap influences the rate of collision risk for birds that fly above the water (see **Volume 1, Chapter 12: Offshore and Intertidal Ornithology** for detail).

2.2.3.9 In determining the air gap for the Project, consideration was given to alternative designs that increased the tower length, increased the buoyancy of the floating unit to raise the base of the tower, and increasing the stiffness of the 'station keeping system'. This concluded that shorter towers out-perform the other options in terms of engineering feasibility and offshore safety performance.

2.2.3.10 It is recognised that increased air gaps can result in decreased collision risks. The Project therefore undertook collision risk modelling for seabirds, based on a range of air gaps from 22m to 30m to understand the difference between the different air gaps.

2.2.3.11 This work concluded that the rates of collision would be low for all air gaps considered, with the numbers impacted by a 22m air gap being considerably lower than other fixed foundation projects in the North Sea that have achieved consent. This is due to the location of the OAA over 75km offshore and the relatively low numbers of birds found to be present.

2.2.3.12 In addition, the Applicant has undertaken a comprehensive market review of the supply chain to determine the appropriate air gap for the Project. The supply chain refers to all the companies involved in making and delivering the parts needed to build and operate the wind farm, and how these companies work together. This review concluded that the current floating offshore wind supply chain lacks the resilience and maturity required to guarantee the specifications of the alternate designs considered, without jeopardising Project delivery.

2.2.3.13 The Project has therefore undertaken the EIA using a minimum air gap to 22m, to ensure that the Project can procure materials and build the wind farm within the required timeframes. This minimum air gap also enhances the likelihood of the Project successfully leveraging Scotland's local supply chain for component fabrication.

2.2.3.14 A more detailed description of the air gap design decision is provided in the **Derogation Case Appendix C WTG Air Gap Supporting Document**.

2.2.4 Floating unit design alternatives

Floating versus fixed foundation technologies

2.2.4.1 Prior to the ScotWind Leasing auction in 2022, the applicant investigated all the ScotWind Plan Options available to identify which OAA to pursue. Consideration was given to sites that had ground conditions and water depths suitable for floating units or fixed base foundations. Water depths exceeding 60m were considered suitable for floating units, and the area available at specific water depth ranges needed to be sufficiently large to enable a commercially viable project. Based upon the commercial and development objectives of the Applicant, this led to a focus on floating technology only for the Project, with fixed base foundations excluded as an option.

Floating unit alternatives

2.2.4.2 There are numerous floating unit concepts in the market, at varying levels of technical readiness. The Applicant has undertaken an assessment to evaluate and reduce the type of floating concepts considered for the Project. The Project also has varying water depths across the NE7 OAA, which potentially makes it suitable for different types of floating unit concepts.

2.2.4.3 In 2023, the Project evaluated approximately 40 different floating unit designs, ranging between proven technology designs such as semi-submersibles, to alternative novel designs that have potential to offer significant advantages. This produced a short-list of 14 floating unit designs, which was subsequently refined further to a final short list of five designs that includes options for semi-submersible, barge, and tension-leg, and other hybrid designs.

2.2.4.4 This short list will be re-evaluated in the detailed design stage and subject to market availability, so it is imperative that the design envelope for the EIA retains optionality for floating unit designs.

2.2.5 Offshore platforms

2.2.5.1 At Scoping, gravity base foundation (large heavy concrete blocks that hold the platform in place by gravity) and floating foundations were included as options for the offshore substation foundations alongside steel jackets secured by driven piles, and steel jackets secured by suction caisson buckets. Gravity base and floating foundations have subsequently been excluded from the design envelope due to technical, economic and environmental reasons.

2.2.5.2 At Scoping, a bespoke platform was considered for the provision of permanent welfare, housekeeping, and accommodation facilities for personnel working on-site offshore during the O&M stage of the Project. This has also been subsequently excluded from the design envelope due to economic and environmental reasons.

2.2.5.3 If High Voltage Alternating Current (HVAC) transmission technology is selected in Phase 2 of the Project, then the offshore export cable may require the installation of up to two RCP(s) containing equipment to improve export power quality, voltage stability and transmission efficiency. The offshore export cables would connect into the RCP(s), and further cables would continue from the RCP(s) to the landfall site(s). The optimum location for the RCP(s) would be approximately 40-60% along the total export cable route between an offshore substation within the array and the onshore substation. A search area that met these criteria has therefore been identified. The exact location of the RCP(s) within the search area will be defined during the detailed design stage, once it is confirmed whether HVAC is required.

2.2.6 Offshore export cable corridor routing

2.2.6.1 The development of the routing for the offshore export cable corridor was developed in line with the four stages set out in **Plate 2**.

2.2.6.2 Selection stage 1 for the offshore export cable corridor needed to cover a broad search area between the OAA and the Aberdeenshire coast. This area needed to be sufficiently wide to accommodate two potential onshore connections that were under consideration at that time. The boundary of the offshore export cable corridor search area in stage 1 was designed to provide adequate flexibility for connecting the OAA to the grid connection point(s), and to allow sufficient space for export cable route optioneering to avoid and / or circumnavigate key areas of identified environmental sensitivity or construction risk along the route.

2.2.6.3 Selection stage 2 included a comprehensive offshore export cable route study, which was conducted to analyse offshore geological and environmental constraints and to determine an export cable route suitable to define the extent of preliminary marine site investigation surveys.

2.2.6.4 In 2023, a marine survey was commissioned in order to inform the site selection analysis for an export cable connection between the OAA and potential landfall zones along the Aberdeenshire coastline. This survey provided the first detailed and site-specific geophysical, geotechnical and environmental information on the areas of seabed of interest to the Project.

2.2.6.5 The findings of this marine survey were used to inform further route refinement such that an early offshore export cable corridor could be presented to stakeholders at Statutory Consultation 1.

2.2.6.6 In selection stage 3, a cumulative constraints gap analysis was undertaken in the nearshore area around Peterhead and Sandford Bay. This provided supplementary information regarding the additional nearshore route to Lunderton and additional information on the heavily constrained area near Peterhead and Peterhead harbour.

2.2.6.7 The study fed into the definition of the boundary for Statutory Consultation 2, which included and retained the additional nearshore route to Lunderton but excluded Sandford Bay as a viable landfall. It was excluded because it was deemed to be too heavily constrained in the nearshore environment, particularly when considered against constraints to landfall and onward terrestrial cable routing in the onshore environment.

2.2.6.8 In selection stage 4, greater engineering definition was applied following further analysis and interpretation of the marine survey outputs. This allowed for the definition of a Red Line Boundary for the EIA in relation to the offshore export cable corridor, and refinement of the offshore export cable corridor width, as required for the number of cables being proposed including the need for the separation space required between them.

2.3 Onshore design evolution

2.3.1 Introduction

2.3.1.1 A site selection exercise was undertaken to identify suitable locations for the landfall(s), the onshore export cable corridor, and the onshore substations. All the available feasible options for onshore sites were identified and appraised environmentally, technically and commercially. These were then subsequently refined to create the proposed Red Line Boundary.

2.3.2 Landfall(s)

2.3.2.1 The landfall is the point at which the offshore export cables cross from the marine environment through the intertidal zone to the terrestrial environment and connect to the onshore export cables.

2.3.2.2 The landfall site identification process was initially undertaken on the basis that solutions would need to be appropriate for either a grid connection point at New Deer or a connection in the vicinity of Peterhead.

2.3.2.3 A landfall search area was developed reaching from Troup Head in the north to Black Dog Beach, north of Aberdeen, in the south.

2.3.2.4 These spatial extents were chosen to provide a range of options for locating the landfall(s), whilst minimising the distance of both an offshore and onshore export cable corridor between the WTGs and both potential grid connection points to reduce potential environmental impacts and technical constraints.

2.3.2.5 The extents of the search area were then refined to avoid the Troup, Pennan and Lion's Head Special Protection Area (SPA), which covers 16km of coastline around Troup Head, and the combined extent of the Buchan Ness to Collieston Coast SPA and the Ythan Estuary, Sands of Forvie and Meikle Loch SPA / Ramsar.

2.3.2.6 This effectively narrowed the search area down to the stretch of coast between Rosehearty on the north coast (west of Fraserburgh) to Sandford Bay (south of Peterhead). Environmental, commercial and technical constraints were also identified and mapped at this stage, in order to provide a framework for assessment and selection going forward.

2.3.2.7 In 2024, the Project's 3GW connection was confirmed as the planned SSEN Netherton Hub to the west of Peterhead. Landfall site selection therefore focused on options for connections to SSEN Netherton Hub.

2.3.2.8 Consideration of key constraints within the landfall(s) search area was given to allow the coastline to be divided into four zones:

- Zone LF1 - in the Fraserburgh vicinity;
- Zone LF2 - covered the area from St. Combs to Rattray Head;
- Zone LF3 - covered the coastline between Peterhead and St. Fergus Gas Terminal; and
- Zone LF4 - covered the (small) area of available coastline to the south of Peterhead at Sandford Bay.

2.3.2.9 An appraisal of the zones was conducted, which included an assessment of ground conditions and topography, access and environmental and planning considerations. It concluded that Zones LF3 and LF4 offered better potential for the siting of the landfall(s), largely on the grounds that:

- they avoided the designated areas of environmental sensitivity further up the coast for example, Rosehearty to Fraserburgh Coast Site of Special Scientific Interest (SSSI) and the Loch of Strathbeg SSSI, SPA and Ramsar site); and
- they offered substantially shorter onshore export cable corridors to SSEN Netherton Hub, reducing potential interaction with sensitive features in the onshore environment.

2.3.2.10 Two areas within Zone LF3 provided distinct options for landfall(s) construction:

- Scotstown Beach - covering the stretch of coastline between St. Fergus Gas Terminal site to the north and a rocky outcrop at the southern extent of the beach; and
- Lunderton - where a (different) rock outcrop marks the northern end of the beach and the extent of the potential landfall(s) area, and the mouth of the River Ugie marks the southern end.

2.3.2.11 Landfall Zone LF4 comprises 0.4km of coastline from Peterhead town in the north to the northern extent of the Buchan Ness to Collieston Coast SPA in the south. As the zone itself is very small, there is only one site option within the zone for the potential construction of the landfall(s).

2.3.2.12 These three options were included within the Project boundary presented at Statutory Consultation Round 1, see **Plate 3** below which illustrates the three-remaining landfall(s) options.

Plate 3 Landfall Zone LF3 and landfall Zone LF4 site options

2.3.2.13 Following Statutory Consultation 1 and in consideration of feedback from consultees, a comparative assessment of the three landfall site options was carried out, with the conclusion that the northernmost sites (Scotstown and Lunderton) offered the greatest advantages.

2.3.2.14 During this period, it was also confirmed that the preferred landing point for the Eastern Green Link (EGL) 3 interconnector project was at Sandford Bay (this in addition to the EGL2 project, for which a planning application had been submitted). Consultation with SSEN, the developers of EGL2 and EGL3 (with National Grid) led to the conclusion that, following installation of the EGL projects, the remaining space would not be sufficient for the Project, this rendered Sandford Bay unsuitable.

2.3.2.15 The decision was therefore taken at this time to exclude Sandford Bay from further consideration, and the Project boundary was adjusted at Statutory Consultation 2 to include only Scotstown and Lunderton.

2.3.2.16 Whilst it is preferable for the Project to use a single landfall site with sufficient space to accommodate the maximum envelope infrastructure, there is, and may continue to be, significant uncertainty over coastline availability due to the planned presence of multiple neighbouring projects, some of which will also connect to the grid at Peterhead. Positive collaboration with neighbouring developers has been established, but ultimately it is

necessary to retain some flexibility over landfall options. For this reason, Lunderton and Scotstown are both included within the Onshore Red Line Boundary.

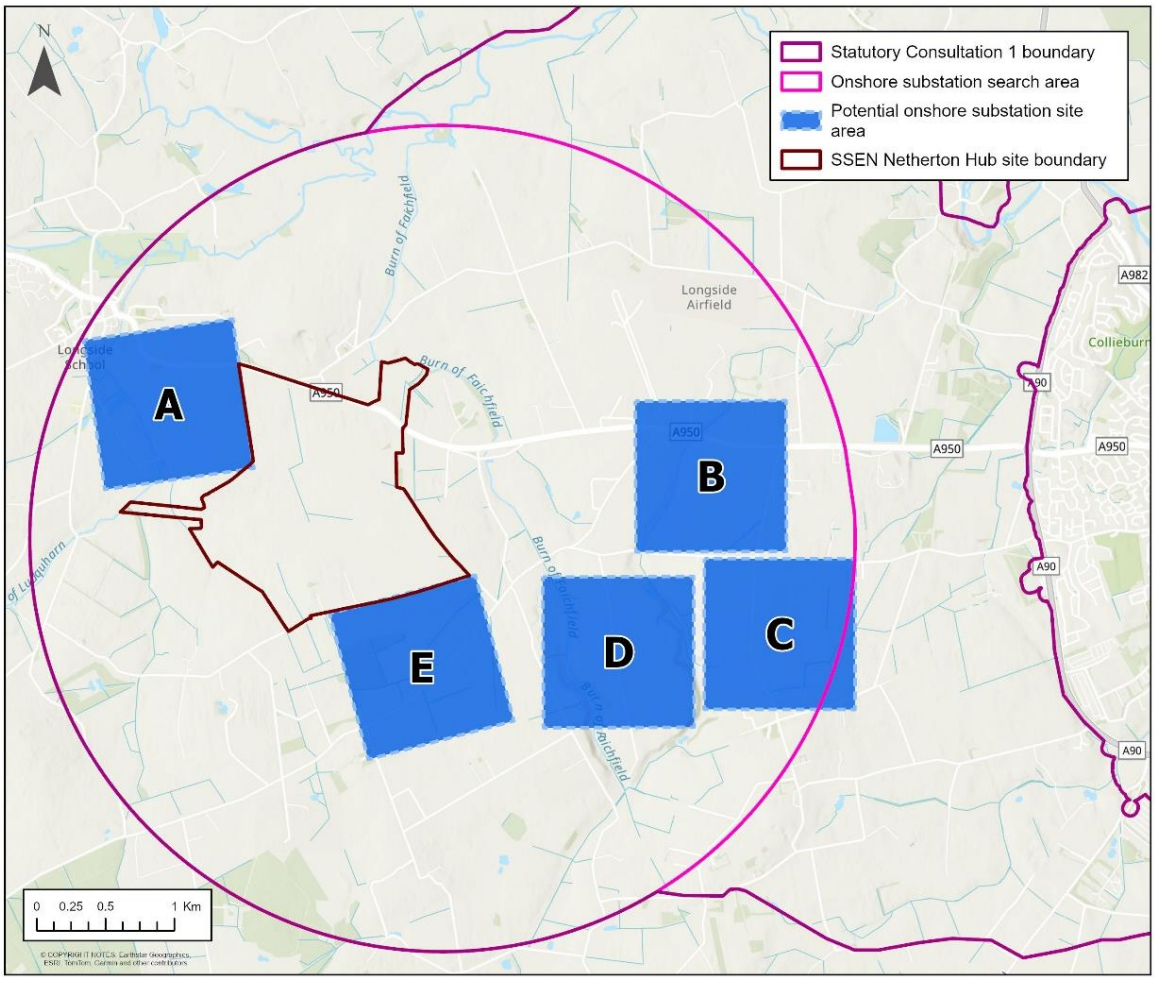
2.3.3 Onshore substations

2.3.3.1 There are significant technical advantages to be gained by locating the Project's onshore substations close to the grid connection point. On confirmation of the grid connection location, this was set as a circle of 3km radius around the SSEN Netherton Hub. The search area was divided into eight zones.

2.3.3.2 Following environmental and technical review of the eight zones, two were retained at this stage as potentially advantageous areas for onshore substation site development. Both areas lay immediately south of the A950, and, between them, covered land to the east, south and west of the SSEN Netherton Hub.

2.3.3.3 Onshore substation site options were investigated within these two zones, based on the land take required for the onshore substation site infrastructure and considering the environmental, commercial and technical constraints already established. This process led to the identification of five site options (which were presented at Statutory Consultation 1), see **Plate 4**.

Plate 4 Onshore substation site options at Statutory Consultation 1



2.3.3.4 A comparative assessment of the five site options was carried out, taking into consideration feedback from Statutory Consultation 1, with the conclusion that Options B and C offered the greatest advantages. Site Options B and C were presented at Statutory Consultation 2.

2.3.3.5 Following further review of environmental and technical considerations and taking account of feedback from Statutory Consultation 2, Site Option B was ultimately concluded preferable because of its direct access to the A950, and because the relatively flat site would be easier to construct (and hence less disturbance, traffic and noise) than the alternative site Option C. Some of the land neighbouring site Option B, to the east and to the north, is already in industrial use.

2.3.3.6 Consultation responses received during the Statutory Consultation 2 were also considered, with traffic and transport being reported as the most important consideration to consultees. Direct A-road access at site Option B would require minimal alteration or enhancement to establish, and the site is close to the A90, minimising distances and durations for Project traffic from the trunk road.

2.3.3.7 Site Option B is considered to offer a high level of technical viability with regard to routing of the onshore export cable corridors from the area of coastline containing the landfall options to the grid connection point as it lies approximately between the two.

2.3.3.8 The decision was therefore taken to utilise site Option B, with its subsequent inclusion in the establishment of an Onshore Red Line Boundary for the EIA and consent applications.

2.3.4 Onshore export cable corridor

2.3.4.1 At the Scoping stage it was necessary to define a Scoping Boundary that allowed adequate coverage for potential onshore export cable routes between potential landfall locations and grid connection points. Environmental, commercial and technical constraints were also identified and mapped early in the selection process.

2.3.4.2 On confirmation of the 3GW grid connection at SSEN Netherton Hub, the onshore export cable corridor search area was reduced dramatically to focus in on Peterhead and landfall Zones LF3 and LF4.

2.3.4.3 To enable the landfall(s) and onshore substations options to be connected by the onshore export cable corridor, a preliminary network of potential routes was created to explore the optimum routes that might serve the landfalls and onshore substation sites being considered at this time, while minimising the interaction with identified constraints and ensuring routes were appropriate from a construction perspective.

2.3.4.4 The Statutory Consultation 1 boundary was set to include all routes in the onshore export cable corridor being considered at that time. The onshore substations search area extent was also included, to allow for flexibility in accessing the onshore substation site options under consideration. The landfall(s) under consideration were also included in full.

2.3.4.5 Further assessment and refinement of the potential onshore export cable routes to onshore substation site options B and C from the landfall(s) areas, and onwards to SSEN Netherton Hub, led to the emergence of two main onshore export cable corridor branches: one to the west of Longside Airfield and one to the east.

2.3.4.6 The shorter route to the east of the airfield was viewed as preferable as it was more direct, and more easily accessible for construction traffic. Whilst both routes cross a number of unavoidable features, including the River Ugie and the Burn of Faichfield, the western route interacts more significantly with the Burn, and would also require additional crossings of buried pipelines that run through the area.

2.3.4.7 Consequently, although the western route was considered viable, the eastern route was preferred and was therefore presented as the 'primary' route at Statutory Consultation 2 (the western route being labelled 'alternative').

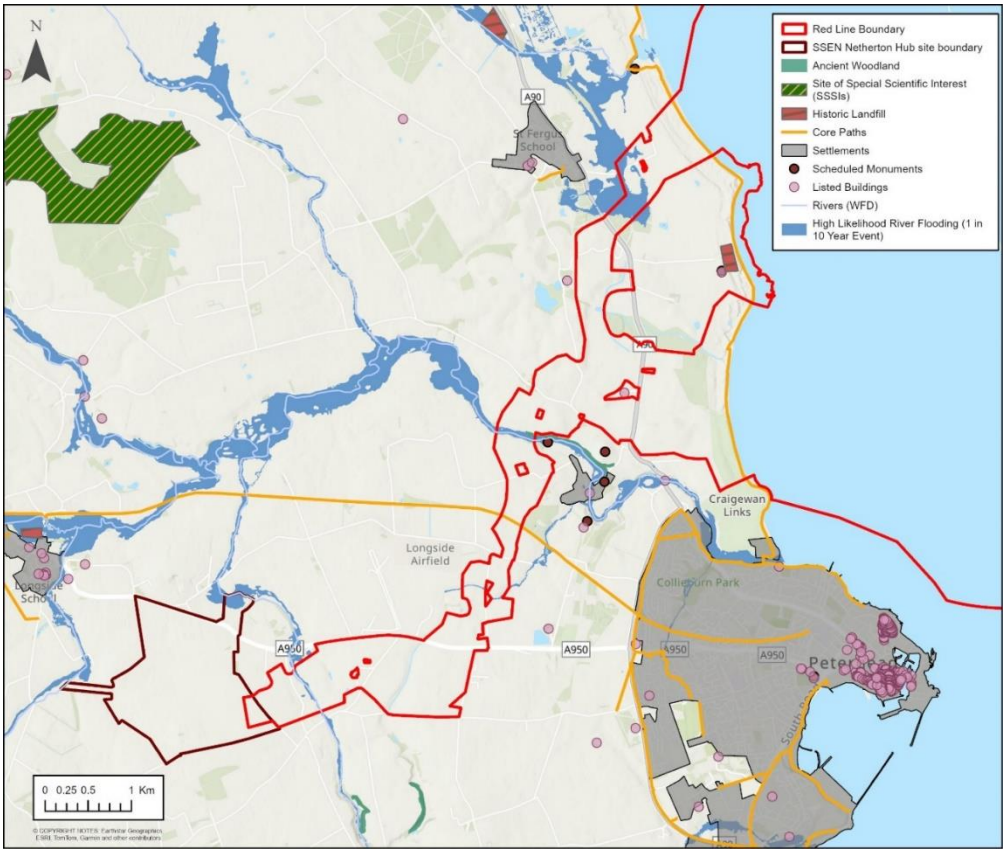
2.3.4.8 Responses received at Statutory Consultation 2 relating to the onshore infrastructure indicated that the key development considerations to consultees were traffic and transport and landscape and visual.

2.3.4.9 These consultee priorities supported the preference for the primary onshore export cable corridor to the east of Longside Airfield. Having the route run closer to Peterhead and the A90 trunk road would reduce traffic impact and also reduce the need for disturbance on local roads. Visually, the eastern route would generally run through and closer to semi-industrial areas, rather than open fields and farmland, and the degree to which construction would be visible from the Formantine and Buchan Way Core Path and Long-Distance Route would also be less. In addition, the primary route would be shorter and more direct and consequently have a smaller footprint, thus minimising the overall environmental impact during construction.

2.3.4.10 The decision was therefore taken to discount the alternative western route around the airfield in favour of the primary eastern onshore export cable corridor.

2.3.4.11 The primary onshore export cable corridor was refined further at this stage, reflecting the desire to provide greater certainty to affected landowners and move towards a final construction corridor. In some areas, residential sites were removed from the Onshore Red Line Boundary. This resulted in the identification of a preferred onshore export cable corridor retained in the establishment of an Onshore Red Line Boundary for this EIA and Application, see **Plate 5** below.

Plate 5 Onshore export cable corridor Onshore Red Line Boundary



3. Project Description

3.1 Key components of the Project

3.1.1.1 The Project comprises both onshore and offshore infrastructure associated with the proposed offshore wind farm, as described in **Volume 1, Chapter 4: Project Description** of the EIA Report. The key components of the Project are summarised in **Section 3.2 and Section 3.3** below.

3.1.1.2 The Project requires both High Voltage Alternating Current (HVAC) and High Voltage Direct Current (HVDC) transmission technologies, with both technologies and their associated infrastructure considered within the EIA.

3.2 Offshore components

3.2.1.1 The offshore components of the Project refer to infrastructure works seaward of MHWS. These are described below from the point of generation, in the direction of the flow of electricity towards the landfall(s).

3.2.2 Wind turbine generators

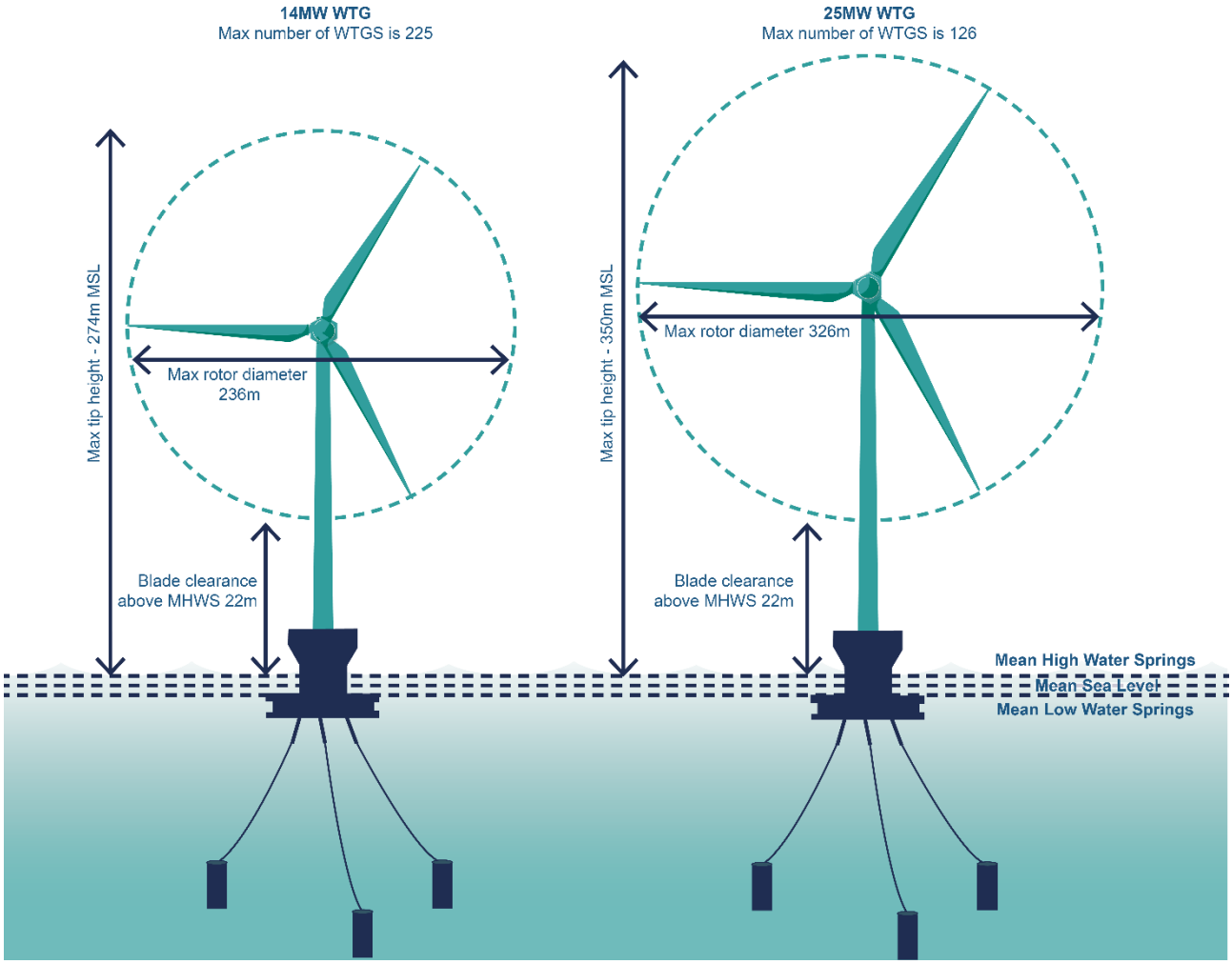
3.2.2.1 The Project will have a total grid connection capacity of up to 3GW. The generating capacity of the offshore wind array depends upon a range of WTG specifications, which are not yet agreed.

3.2.2.2 As WTG technology is continually evolving, it is difficult to definitively predict the generating capacity of WTGs that will be commercially available at the point of construction. As is common for all offshore wind farms, the final choice of WTG will be subject to a procurement exercise carried out post-consent.

3.2.2.3 The EIA considers two WTG power output scenarios based on the minimum and maximum characteristics of turbine models that are expected to be available at the time of procurement. These are 14 megawatt (MW) and 25MW WTG scenarios, which would result in up to 225 WTGs under the 14MW WTG scenario, and up to 126 WTGs under the 25MW scenario. The 25MW WTGS will be larger in size than the 14MW WTGs (see **Plate 6**).

3.2.2.4 Irrespective of size, the WTGs will comprise three turbine blades linked to a horizontal rotor axis and attached to a nacelle, which houses a gearbox, generator, and transformer (see **Plate 6**). This will be placed at the top of a tower, which is expected to be assembled in sections. The nacelle will be able to rotate on the vertical axis in order to face the oncoming wind direction. The WTGs will include appropriate lighting and markers for aviation and navigation.

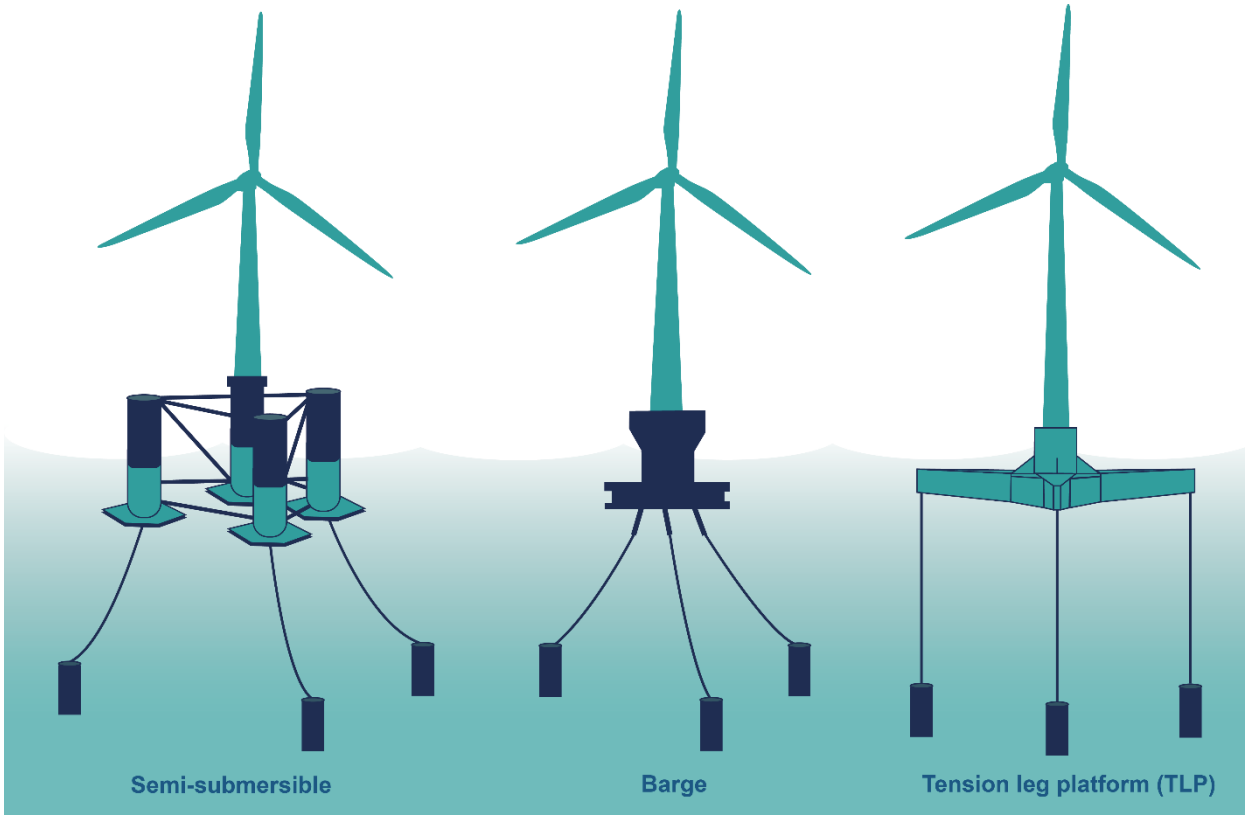
Plate 6 Illustration of wind turbine generator maximum dimensions



3.2.3 Floating units and moorings

3.2.3.1 The WTGs will each be mounted on a floating unit that will be secured to the seabed by a dedicated 'station keeping system'. The station keeping system consists primarily of mooring lines and seabed anchors. Several design options are being considered for the floating units and station keeping system. The final design concept will be identified following further market engagement, site survey and design development. The EIA Report considers a design envelope associated with a potential range of floating unit types. Three designs are currently being considered for the floating units: semi-submersible, barge and tension leg platform (as illustrated in **Plate 7**). However, any other hybrid design to take into account emerging or future technologies will also be considered.

Plate 7 Illustration of floating unit types considered



3.2.3.2 A key component of all floating unit designs is the mooring of the floating unit to anchor points on the seabed. The purpose of moorings is to maintain the position of the floating unit and WTG against the forces of wind and waves over the lifetime of the Project. Mooring lines may be made up of chain, synthetic fibre or steel wire elements or any combination of these.

3.2.3.3 The mooring concepts being considered are:

- catenary mooring (in which each mooring line hangs in a slack curve dictated by its own weight);
- semi-taut mooring (in which slack and taut elements are used in combination in the mooring system);
- taut-line mooring (in which each mooring line is tensioned until it is taut); and
- vertical tension mooring (in which each mooring line, or "tendon", is installed near vertically and kept under constant high tension, with stability providing by the restoring force from the tendons resisting vertical displacement of the floating structure).

3.2.3.4 There is a wide spectrum of anchoring solutions that could be installed for the concepts identified above. These include drag embedment anchors, driven piles and suction anchors.

3.2.4 Array cables

3.2.4.1 Array cables will be used to connect the WTGs to other parts of the offshore infrastructure. This includes connecting the WTGs to each other, to the offshore substations, or to the SDCs depending on the layout requirements. The cables will have a requirement to withstand the dynamic conditions of the North Sea as well as the relatively static conditions on (or within) the seabed.

3.2.4.2 The total maximum array cable length for the full 3GW is expected to be up to 680km.

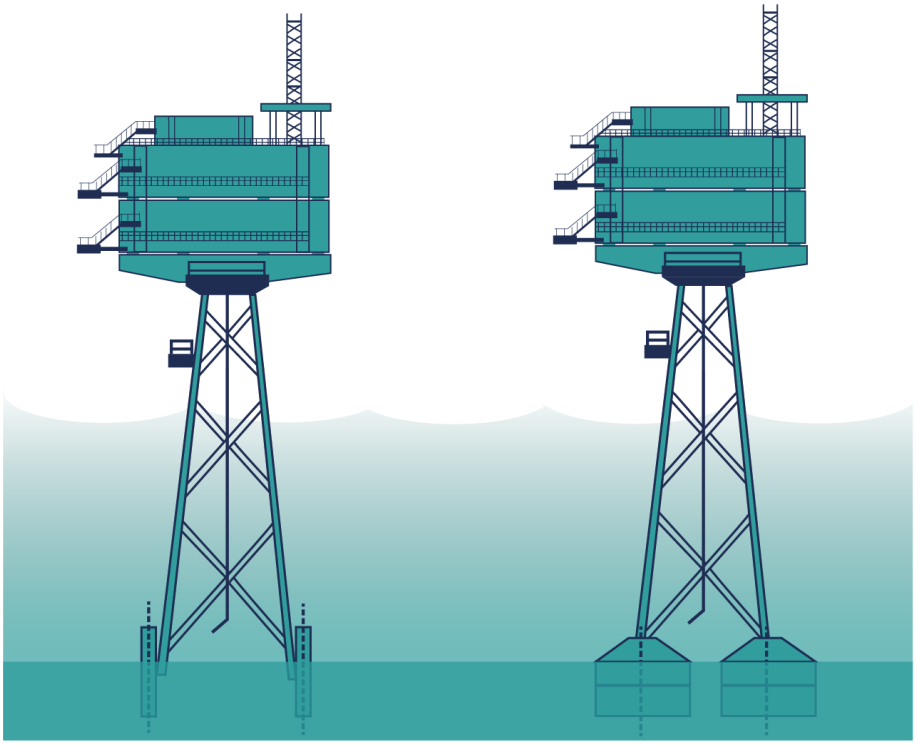
3.2.5 Offshore substations

3.2.5.1 The WTGs will connect to offshore substation platforms via the array cables and SDCs (if deployed). It is anticipated that there will be up to four offshore substations within the OAA associated with the Project. The offshore substations will transform generated electricity from the WTGs to a higher voltage for transmission to shore via offshore export cables. The location and extent of the offshore substations will be confirmed through the detailed design process, but will be located within the Red Line Boundary.

3.2.5.2 The offshore substations will house the main electrical equipment, auxiliary, controls and operational systems necessary. The offshore substations may also include a helideck. The offshore substations will include appropriate lighting and markers for aviation and navigational safety.

3.2.5.3 It is anticipated that the offshore substation platform foundations, that will support the topside equipment, will be either jacket secured by driven piles or suction caisson fixed foundations (see **Plate 8**).

Plate 8 Illustration of fixed foundation types



Jacket with driven piles Jacket with caissons

3.2.6 Offshore export cables and cable protection

3.2.6.1 The wind farm would be connected to the landfall(s) by a maximum of five offshore export cable circuits. Each will be laid in a separate trench in the seabed. They will connect to onshore export cables via a transition joint bay, that will connect via further cables onward to the onshore substations.

3.2.6.2 The length of the offshore export cables is anticipated to be 130km to 140km, depending on the offshore substation and landfall locations.

3.2.6.3 The offshore export cables will be typically buried 1m to 2m below the seabed for most of their length to the landfall(s) depending on the outcome of the cable burial risk assessment. The exact routing of the export cables within the offshore export cable corridor will be determined during the detailed design process of the Project, with consideration of seabed conditions and environmental sensitivities following pre-construction surveys.

3.2.6.4 In the few areas where cable burial cannot be achieved, other alternative methods of cable protection will be used. This may be where unsuitable seabed conditions exist or where another cable or pipeline is already in place. External cable protection options include rock armour or concrete mattresses, the exact type, location and dimensions of which are yet to be determined.

3.2.6.5 Due to the sandy and gravely nature of the sediment along the offshore export cable corridor, it is anticipated that the majority of the offshore export cables will be able to be buried and will not require external cable protection.

3.2.7 Reactive compensation platforms (HVAC only)

3.2.7.1 Long distance, large capacity HVAC transmission systems may require RCPs to improve power quality, voltage stability and transmission efficiency.

3.2.7.2 A maximum of two RCPs (if required) will be located approximately 40-60% along the offshore export cable corridor route. This is measured as an approximate mid-point distance between an offshore substation within the array and the onshore substation. Offshore export cables from the OAA would connect into the RCP before exiting the RCP and continuing to the landfall(s). While the location is not yet determined, the Applicant has included possible areas for installation of the structures within the Red Line Boundary and relevant consenting applications.

3.2.7.3 The final location of the RCP(s) within the identified search area will be defined in the detailed design stage, post consent. The siting will take into account final electrical design, water depth, ground conditions, marine traffic, proximity to shore, other existing / planned infrastructure and other engineering and economic factors.

3.2.7.4 The RCPs will likely be paired in proximity to each other and may be connected by a bridge.

3.2.7.5 The design of the RCPs would be similar to the offshore substations. This is likely to be a multi-tier topside module containing the RCP equipment, which is installed on a foundation structure. It is anticipated that the RCP foundations will be either jacket or suction caisson fixed foundations.

3.2.8 Offshore installation methodology

3.2.8.1 Construction of the offshore components of the Project will be completed in a number of stages. The stages are described sequentially below, although given the scale of the Project, it is likely that some stages will be undertaken in parallel. The stages are described as follows:

- pre-construction surveys and seabed preparation activities;
- anchor and mooring line installation;
- floating unit and wind turbine preparatory works;
- floating wind turbine towing to site;
- array cable and SDC installation;
- offshore platform foundation installation and piling;
- offshore platform topside installation;
- offshore export cable installation; and
- WTG commissioning.

3.2.8.2 Equipment and offshore installation activities will be designed to avoid the need for divers wherever possible. However, in some instances this may not be possible and diver operations may be undertaken subject to the appropriate procedures and risk assessment.

3.3 Onshore components

3.3.1.1 The onshore components of the Project refer to infrastructure works landward of MLWS and are shown in **Figure 2**.

Sheet 1

Sheet 2

Sheet 3

Sheet 4

Sheet 5

- Red Line Boundary
- Indicative onshore export cable corridor
- Indicative trenchless crossing compound search area
- Indicative landfall construction compound search area
- Indicative trenchless crossing
- Indicative trenched crossing
- Indicative primary construction compound
- Indicative secondary construction compound
- Indicative temporary construction access road

Onshore substation layout

- Indicative temporary construction compound
- Indicative permanent access road
- Indicative permanent substation footprint

0 500 1,000 1,500 Meters

Peterhead

Scale: 1:500,000

REV	REV DATE	GIS CREATOR	GIS REVIEWER	TECHNICAL CHECKER	TECHNICAL APPROVER
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MarramWind DRAWING NUMBER	MAR-GEN-ENV-MAP-WSP-000614
DATUM	OSGB 1936
PROJECTION	British National Grid
SCALE	1:32,500
PAGE SIZE	A3

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 2 Onshore Red Line Boundary and indicative onshore infrastructure Overview

Environmental Impact Assessment Report

Non-Technical Summary

NOT TO BE USED FOR NAVIGATION

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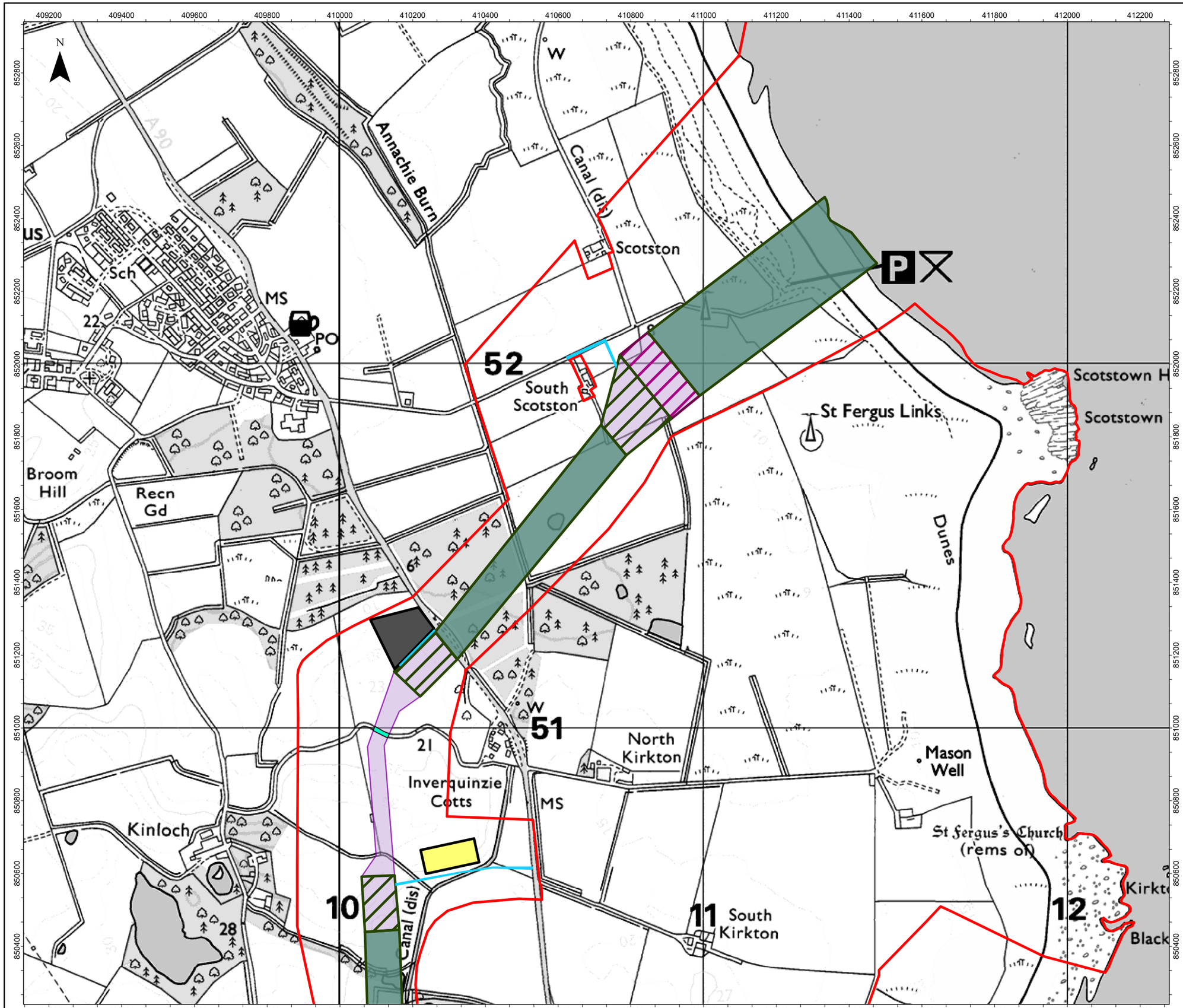
MarramWind



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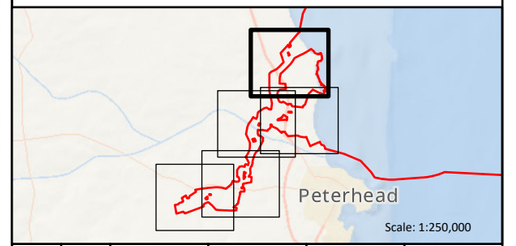

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PROJECT TITLE
MarramWind Offshore Wind Farm

DRAWING TITLE
Figure 2 Onshore Red Line Boundary and indicative onshore infrastructure Sheet 1

Environmental Impact Assessment Report
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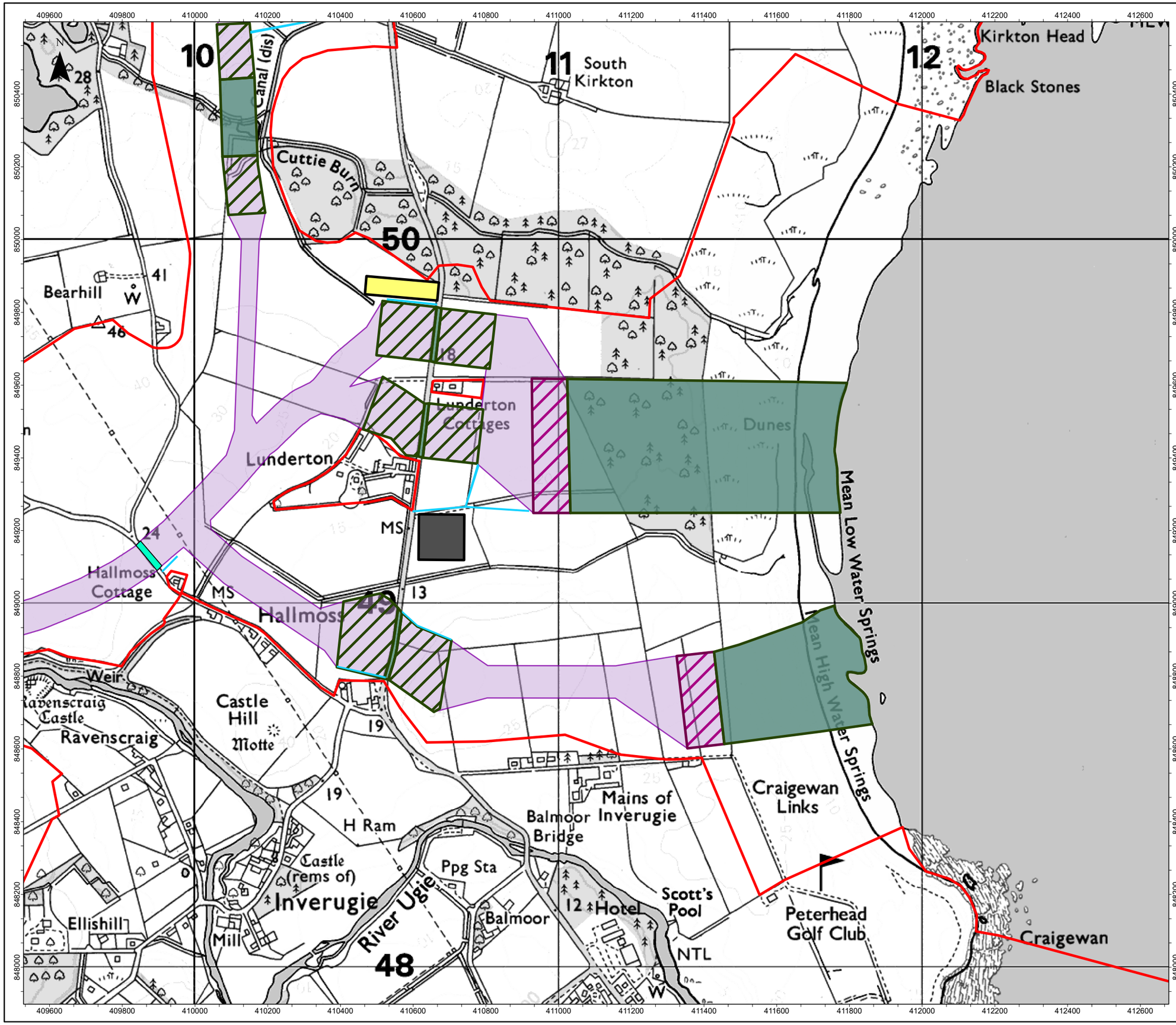

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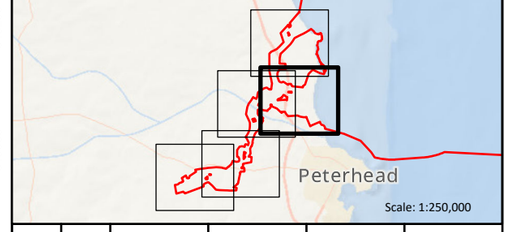

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REV	REV DATE	GIS CREATOR	GIS REVIEWER	TECHNICAL CHECKER	TECHNICAL APPROVER

WSP DRAWING NUMBER	808368-WEIS-IA-E5-FG-N6-70817
MarramWind DRAWING NUMBER	MAR-GEN-ENV-MAP-WSP-000614

DATUM	OSGB 1936	PROJECTION	British National Grid
SCALE	1:10,000	PAGE SIZE	A3

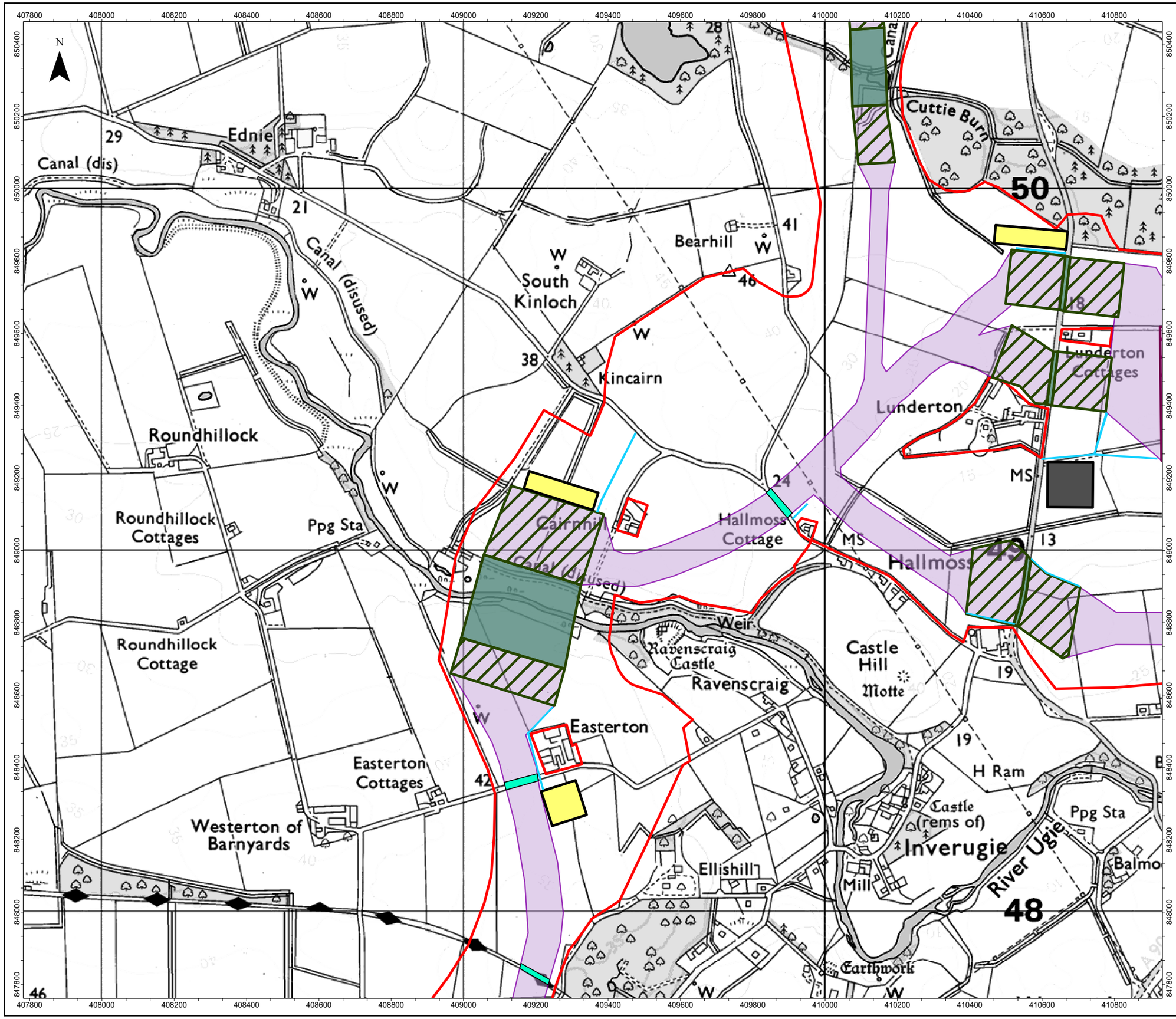
PROJECT TITLE
MarramWind Offshore Wind Farm

DRAWING TITLE
Figure 2 Onshore Red Line Boundary and indicative onshore infrastructure Sheet 2

Environmental Impact Assessment Report
Non-Technical Summary

NOT TO BE USED FOR NAVIGATION

wsp MarramWind



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1	31/10/2025	LT	AMc	MW	NC

WSP DRAWING NUMBER	808368-WEIS-IA-E5-FG-N6-70817
MarramWind DRAWING NUMBER	MAR-GEN-ENV-MAP-WSP-000614
DATUM	OSGB 1936
PROJECTION	British National Grid
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PAGE SIZE	A3

PROJECT TITLE
MarramWind Offshore Wind Farm

DRAWING TITLE
Figure 2 Onshore Red Line Boundary and indicative onshore infrastructure Sheet 3

Environmental Impact Assessment Report
Non-Technical Summary

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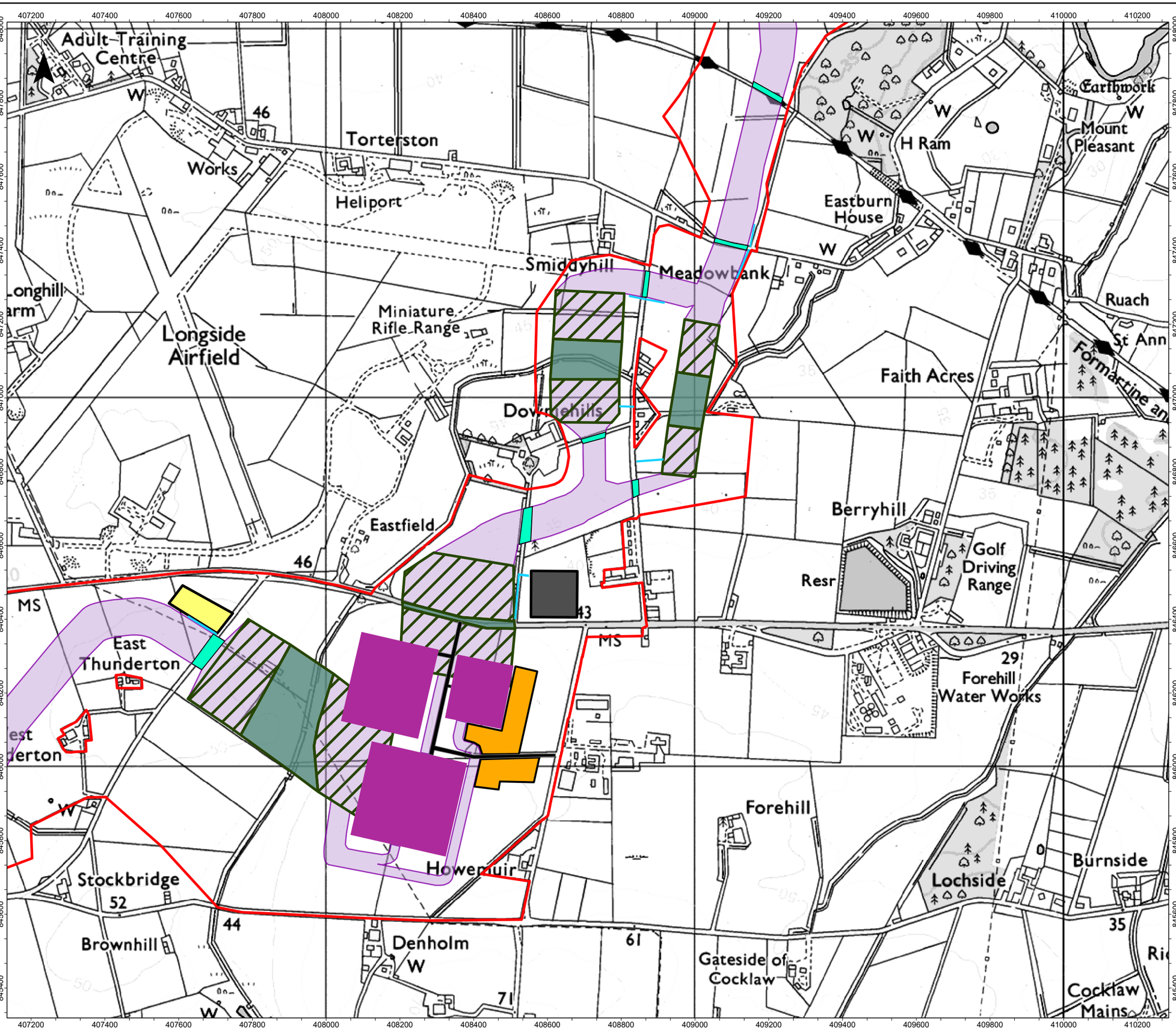
MarramWind



Red Line Boundary

Indicative onshore export cable corridor

Indicative trenchless crossing compound search area

Indicative trenchless crossing

Indicative trenched crossing

Indicative primary construction compound

Indicative secondary construction compound

Indicative temporary construction access road

Onshore substation layout

Indicative temporary construction compound

Indicative permanent access road

Indicative permanent substation footprint

REV	REV DATE	GIS CREATOR	GIS REVIEWER	TECHNICAL CHECKER	TECHNICAL APPROVER
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1	31/10/2025	LT	AMc	MW	NC

WSP DRAWING NUMBER	808368-WEIS-IA-E5-FG-N6-70817
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DATUM	OSGB 1936
PROJECTION	British National Grid
SCALE	1:10,000
PAGE SIZE	A3

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 2 Onshore Red Line Boundary and indicative onshore infrastructure Sheet 4

Environmental Impact Assessment Report

Non-Technical Summary

NOT TO BE USED FOR NAVIGATION

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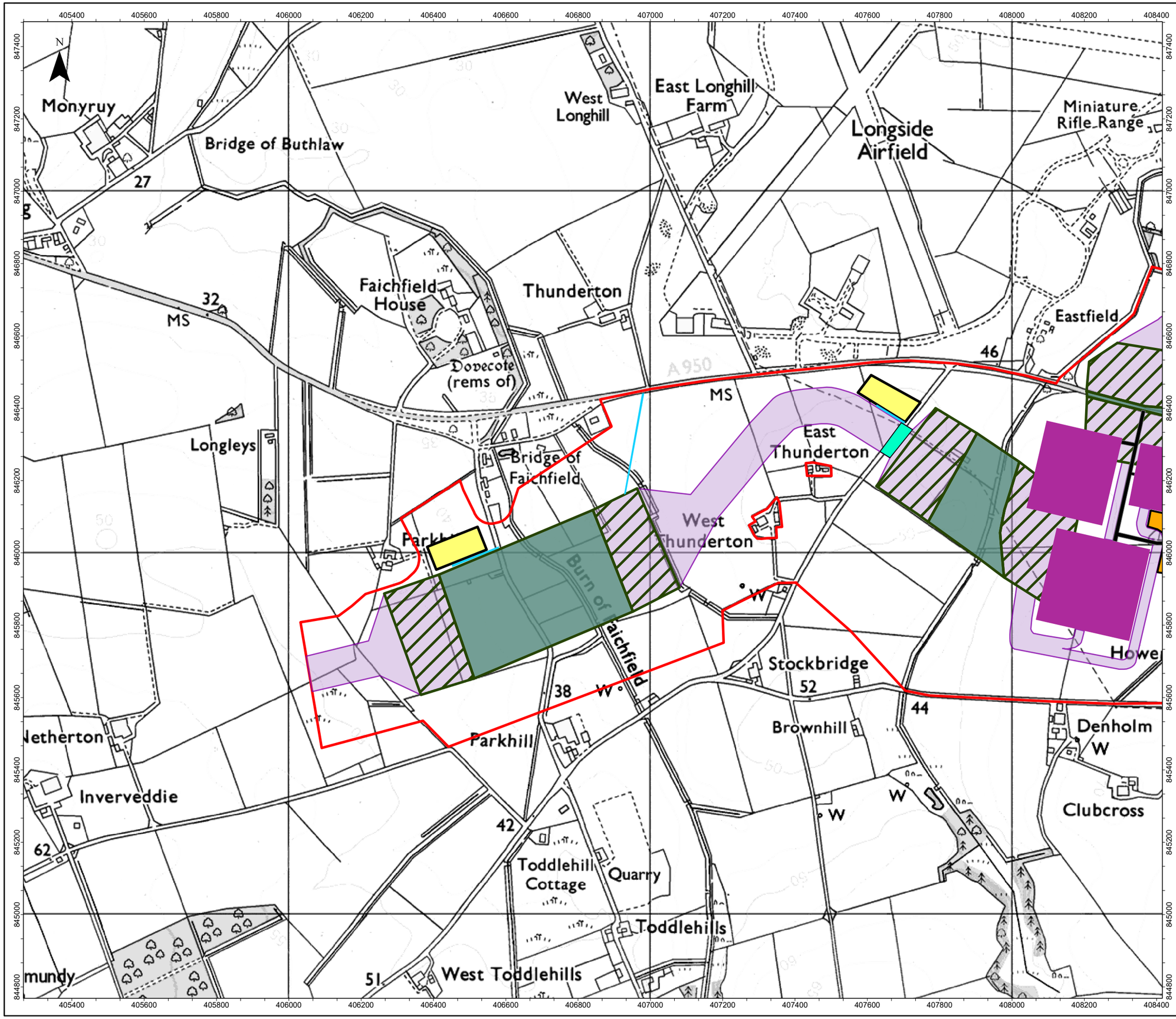
MarramWind



Red Line Boundary

Indicative onshore export cable corridor

Indicative trenchless crossing compound search area

Indicative trenchless crossing

Indicative trenched crossing

Indicative secondary construction compound

Indicative temporary construction access road

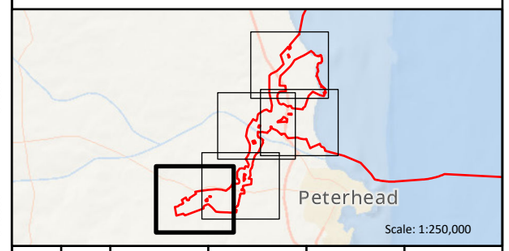
Onshore substation layout

Indicative temporary construction compound

Indicative permanent access road

Indicative permanent substation footprint

0 500 Meters



REV	REV DATE	GIS CREATOR	GIS REVIEWER	TECHNICAL CHECKER	TECHNICAL APPROVER
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1	31/10/2025	LT	AMc	MW	NC

WSP DRAWING NUMBER	808368-WEIS-IA-E5-FG-N6-70817		
MarramWind DRAWING NUMBER	MAR-GEN-ENV-MAP-WSP-000614		
DATUM	OSGB 1936	PROJECTION	British National Grid
SCALE	1:10,000	PAGE SIZE	A3

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 2 Onshore Red Line Boundary and indicative onshore infrastructure Sheet 5

Environmental Impact Assessment Report

Non-Technical Summary

NOT TO BE USED FOR NAVIGATION

wsp

MarramWind

3.3.2 Landfall(s)

3.3.2.1 More than one landfall may be required to accommodate the cabling necessary for the Project's full 3GW. The Applicant is actively exploring collaboration opportunities with other projects connecting into the Peterhead area. The Project's intent is to utilise one landfall location but retains the flexibility of multiple landfall options. This is to ensure the Project can secure sufficient space, in appropriate locations, to construct the landfall(s) and associated onshore and offshore export cables, whilst ensuring any environmental impact is kept to a minimum in isolation and cumulatively.

3.3.2.2 The following landfall options which have been assessed in the EIA Report:

- Option 1: Lunderton – all offshore export cables would make landfall at Lunderton, based on the following scenarios:
  - Option 1a: export cables make landfall at Lunderton North; or
  - Option 1b: all export cables would make landfall at a combination of Lunderton North and Lunderton South; or
- Option 2: Scotstown and Lunderton – export cables would make landfall at a combination of Lunderton (North and / or South) and Scotstown.

3.3.2.3 A final decision on the landfall/s to be taken forward will be subject to land agreements and detailed design post-consent.

3.3.2.4 The locations of the landfall(s) options are shown in **Figure 2**.

3.3.2.5 The landfall(s) infrastructure will be constructed in three phases, to align with the phased installation of the offshore export cables and energisation of the WTGs.

3.3.2.6 Landfall(s) works landward of MLWS include:

- construction of access to the landfall(s) and landfall(s) temporary construction compound;
- establishment of a landfall(s) temporary construction compound;
- drilling of bores for cable ducts (24-hour working);
- installation of ducts into the bores;
- construction of transition joint bays;
- pull-in of offshore export cables into ducts from the cable lay vessel;
- jointing of offshore cables to onshore export cables in transition joint bays;
- backfilling of transition joint bays; and
- demobilisation of site and reinstatement works.

3.3.2.7 Landfall works seaward of MHWS include:

- marine support during drilling of bores;
- marine support during installation of ducts;
- marine support during pulling in of offshore cables into ducts;
- installation of cable protection systems (if required); and
- burial / protection of duct ends and offshore cables in duct vicinity.

3.3.2.8 To reduce the environmental impact of the landfall(s), a trenchless solution is to be implemented to install ducts. Whilst other trenchless methods are available, horizontal directional drilling (HDD) (or similar trenchless technique) is presented as the option within the EIA Report. Determination of the most suitable trenchless landfall crossing method will be undertaken during the detailed design stage of the Project, following geotechnical investigation of the onshore and nearshore areas.

3.3.2.9 Temporary construction access to the landfall(s) will be from the A90 to the landfall(s) temporary construction compound at each landfall, as indicated in **Figure 2**. A landfall temporary construction compound is a fenced off area within which the HDD (or similar trenchless technique) operations are undertaken, transition joint bays for connecting onshore and offshore export cables are constructed, and offshore export cables are pulled through ducts and connected to the onshore export cables. The landfall(s) temporary construction compound will accommodate all drilling activities and equipment, provide a laydown area for construction equipment and materials, parking for vehicles, and offices and welfare facilities for site workers.

3.3.2.10 Following completion of the offshore and onshore export cable installation, the cables will undergo final testing and commissioning. The landfall(s) temporary construction compound and temporary construction access road will be removed and the landfall(s) will be reinstated in full.

3.3.3 Onshore substations

3.3.3.1 Three onshore substations are required for the Project. They will be co-located within the onshore substation site, one for each Project phase (see **Figure 2**). The three onshore substations will accommodate a total combined capacity of 3GW. The purpose of the new onshore substations is to transform / convert the onshore export cable voltage to the 400kV required to connect to the proposed SSEN Netherton Hub and to house the electrical components required to ensure the offshore wind farm export power is compliant with UK Grid Code (NESO, 2023).

3.3.3.2 The onshore substation for each phase of the Project will either be an HVAC substation, or an HVDC converter station. As both transmission technologies may be required, both options are assessed in the EIA report.

3.3.3.3 At this stage, a decision has not been made on whether the electrical components and equipment necessary to connect the electricity generated by the Project to the national electricity transmission network will be fully housed in buildings or whether this equipment will be partially placed outdoors,. Consequently, both options are assessed in the EIA Report.

3.3.3.4 The three onshore substations will be built sequentially to align with the phased energisation of the WTGs.

3.3.3.5 The maximum permanent footprint for the proposed onshore substations will be up to 15 hectares within the onshore substation site boundary. The remaining site area includes permanent access roads and a combination of landscape and ecological mitigation and drainage works. The maximum onshore substation building / infrastructure height is up to 30 metres (m). The site will be securely fenced.

3.3.3.6 Generally, the construction of the onshore substations will take place during daylight hours with a requirement only for local task lighting. Construction works will involve:

- installation of perimeter fencing;
- ground preparation works;

- installation of underground services and onshore substation site foundations;
- construction of the control and switchgear buildings and plant buildings;
- construction of cable trenches;
- construction of ducts and pits;
- construction of the oil containment bund;
- provision of utility supplies; and
- ecology mitigation, landscaping and drainage works.

3.3.3.7 Access to the onshore substations will be required during construction and subsequently during the O&M stage. There are two construction access points to the site, as illustrated in **Figure 2**.

3.3.4 Onshore export cable corridor

3.3.4.1 Onshore export cables, located within the onshore export cable corridor, are the underground cables that connect from the landfall(s) to the grid connection point at SSEN Netherton Hub, via the onshore substations, as shown in **Figure 2**.

3.3.4.2 The onshore export cable corridor is approximately 11km in length (between the landfall(s) and the onshore substations) and approximately 2.35km (between the onshore substations and SSEN Netherton Hub) and will include:

- Export cables, trenches, ducts, joint bays, and space for storage of excavated material. The typical onshore export cable construction corridor will be up to 89m in width between the landfall(s) to the onshore substations and up to 99m between onshore substations to SSEN Netherton Hub, including trenches, space for storage of excavated material, and haul roads;
- temporary infrastructure including construction compounds, haul roads, access tracks and trenchless crossing areas; and
- permanent infrastructure corridor width up to 61m between the landfall(s) to the onshore substations and up to 71m between onshore substations to SSEN Netherton Hub, including export cables and associated joint bays.

3.3.4.3 The onshore export cables will be installed in three phases to align with the energisation of the WTGs.

3.3.4.4 The onshore export cables for Phase 1 will be either laid directly in trenches or cable ducts will be installed and the onshore export cables for Phase 1 installed into the ducts. In Phase 1 cable ducts will also be installed to enable the later phase cables (Phases 2 and 3) to be installed without having to re-excavate along the entire route.

3.3.4.5 The joint bays, required to connect each section of onshore export cable to the next, will be constructed in three phases, to align with the phased installation of associated onshore export cables. The temporary construction corridor is generally routed as straight as possible to reduce overall length and to facilitate the pulling of cables into ducts

3.3.4.6 If more than one landfall is required, the connecting onshore export cables from the main onshore export cable corridor to the additional landfall(s) may be installed in trenches or ducts to align with the phased installation of the landfall(s).

3.3.4.7 During installation of the onshore export cables, the topsoil and subsoil will be stripped and stored on site within the temporary working corridor and stored in stockpiles. The trenches

will then be excavated using a mechanical excavator, and the cables will be laid directly in trenches or cable ducts will be installed. The cables or ducts are then buried by backfilling the trench with the excavated material before the land is reinstated to its previous use.

3.3.4.8 There are road, watercourse, footpath, third party services, and other crossings along the onshore export cable corridor. Each crossing will be individually reviewed / surveyed again during detailed design to confirm the crossing method to be employed. Crossing techniques are broadly classified as “open cut”, in which the onshore export cable trenches continue across the feature, or “trenchless”, under which different cable installation methods are employed, but all have the aim of avoiding trenching through the feature. Trenchless crossings are expected to be used for main watercourses, such as the River Ugie and its tributaries, key third-party services such as gas mains and the crossing of the A90 and A950 roads.

3.3.4.9 Along the export cable route joint bays will be constructed to enable cable installation and cable jointing, and link boxes where there will be ground level manhole for inspection, with these locations to be determined during the detailed design stage.

3.3.4.10 During construction temporary construction compounds will be required along the export cable corridor to support the installation of the onshore export cable and associated trenchless crossings and joint bays. Indicative locations for temporary construction compounds are shown in **Figure 2**.

3.3.4.11 Temporary construction access points from the road network are required along the onshore export cable corridor to allow the transportation of materials, equipment, and personnel to and from the construction areas. These temporary construction access points will allow access to the temporary construction corridor, via temporary construction access roads, and subsequently the temporary construction haul road running along the onshore export cable corridor, except for locations where there are trenchless or road crossings.

3.3.4.12 Following completion of constructions works, the temporary construction compound facilities and access tracks will be removed, and the areas will be returned to their original state.

3.4 Project timeline

3.4.1.1 An indicative construction programme for the Project is presented in **Plate 9**.

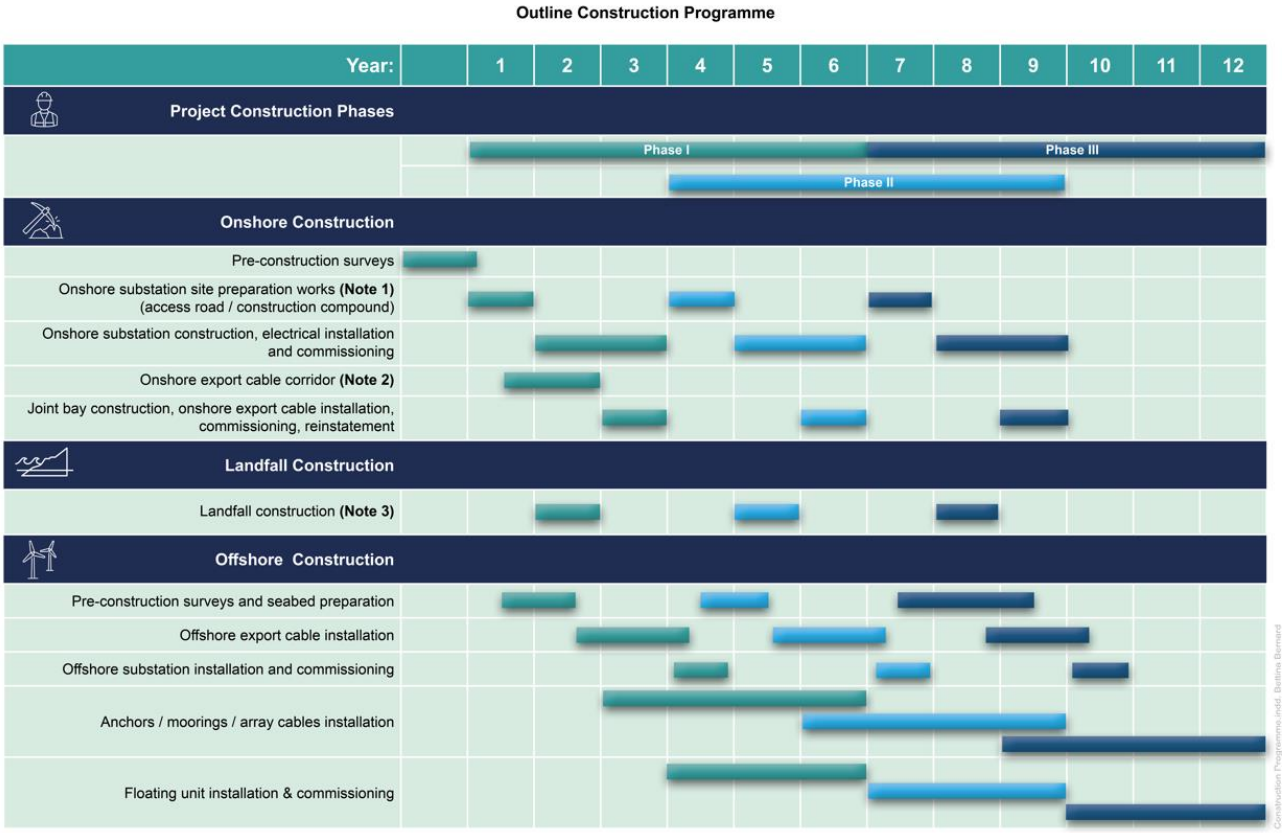
3.4.1.2 The programme illustrates the anticipated duration of the main construction / installation activities by infrastructure component.

3.4.1.3 The overall duration of construction of the offshore infrastructure is anticipated to be up to twelve years. This will be subject to the final grid connection date, supply chain discussions and further site surveys (pre-consent).

3.4.1.4 A shorter period within the twelve years is expected for construction of the onshore infrastructure; in the range of up to nine years.

3.4.1.5 The Project will be delivered in phases, which are reflected in the indicative construction programme. It is anticipated that construction of the Project would commence in 2030.

Plate 9 Indicative construction programme



Note 1: Permanent roads built as part of first phase onshore substation build. No further permanent roads required as part of second & third phases.
Note 2: Includes site preparation works (access / haul roads, construction compounds), cable trenching, horizontal directional drilling works and duct installation for all Project phases.
Note 3: Includes site preparation works (access road / construction compound), transition joint bay construction, horizontal directional drilling works and associated duct installation.

3.4.1.6 It is anticipated that the first phase of the Project would become fully operational in 2037 following commissioning of the WTGs for phase 1. It is anticipated the second phase of the Project would become fully operational in 2040 and the third phase in 2043. The operational lifetime of the Project for each phase is expected to be around 35 years.

3.5 Operation and maintenance

3.5.1.1 O&M activities can be divided into two main categories:

- scheduled maintenance; and
- unscheduled maintenance.

3.5.1.2 The developer is responsible for the O&M activities associated with the generating assets. However, as per the Electricity Act 1989, a generator may not own the transmission system. As such the offshore substations and offshore export cables will be sold to an Offshore Transmission Operator (OFTO), who will be accountable for O&M of the Offshore Transmission assets.

3.5.1.3 After commissioning, and in line with the Electricity Act 1989, the ownership of the offshore substation, RCPs and associated infrastructure to shore, including the onshore substation, will be transferred to a separate third party OFTO. As such it is necessary to keep the flexibility open for different O&M requirements.

3.5.1.4 The overall O&M strategy will be finalised once the O&M base location and technical specifications of the offshore elements are known. A monitoring, inspection and maintenance plan will be put in place to ensure the integrity of all offshore infrastructure associated with the Project. Maintenance requirements will depend on the infrastructure used, depending on the type of wind turbine, floating platforms, electrical transmission infrastructure and final layout of the wind farm. Maintenance and repair operations will typically be undertaken via service operation vessel (SOV). Where necessary, helicopters or other specialised vessels may also be used. Twenty-four-hour operations within the OAA and along the offshore export cable corridor is normal but will be assessed for safety considerations if transfer of personnel is required outwith daylight hours.

3.5.1.5 Onshore infrastructure will require minimal maintenance, with periodic cable testing and occasional unscheduled maintenance and repairs using light vehicles or, rarely, heavy goods vehicles. Infrequently, the onshore export cable may need to be repaired, and sections replaced.

3.5.1.6 The onshore substations will be remotely monitored and maintained during scheduled outages, with lighting and foul drainage systems designed for efficiency and minimal impact. Inspection and minor servicing may be required for the electrical plant, but it is anticipated that the onshore substations will require minimal scheduled maintenance and operation activities. There may be a requirement for unscheduled maintenance or emergency repairs and infrequently equipment may need to be replaced.

3.6 Decommissioning

3.6.1.1 The approach to decommissioning of the offshore infrastructure will be completed in line with any relevant guidance and legislation at the time of decommissioning. It is however expected that all infrastructure above the seabed will be removed. Any infrastructure below the seabed will be assessed to determine if less impactful (from an environmental perspective) to remove or leave in position. This is particularly relevant where new habitats have developed during the O&M stage of the Project.

3.6.1.2 It is anticipated that the onshore export cables will be left in-situ with ends cut, sealed and buried to minimise environmental effects associated with removal. The underground structures of the transition jointing bays, joint bays, fibre optic cable junction boxes and link boxes will be removed only if it is feasible with minimal environmental disturbance or if their removal is required to return the land to its current agricultural use. It should be noted that, whilst this is the current assumption, the regulations and practice applicable at the time of planning for decommissioning will be reviewed and followed.

3.6.1.3 The onshore substations and associated access roads will be removed and the site reinstated. The decommissioning works are likely to be undertaken in reverse to the sequence of construction works and involve similar types and levels of equipment and vehicles. The onshore substation site will be restored to its original state or made suitable for an alternative use.

3.6.1.4 Further detail will be provided in an onshore decommissioning plan, prepared prior to the start of any decommissioning activities.

4. Approach to the EIA

4.1 What is the EIA Report?

4.1.1.1 The EIA Report presents an assessment of the likely significant environmental effects of the Project and forms part of the application for consent.

4.1.1.2 The EIA Report has been prepared as an output of the EIA process. Each technical aspect or topic has been assessed to identify any likely significant environmental effects arising from the Project along with the potential for environmental measures to be implemented to avoid, prevent, reduce or, if possible, offset any identified likely significant environmental effects and how these were fed back into the design.

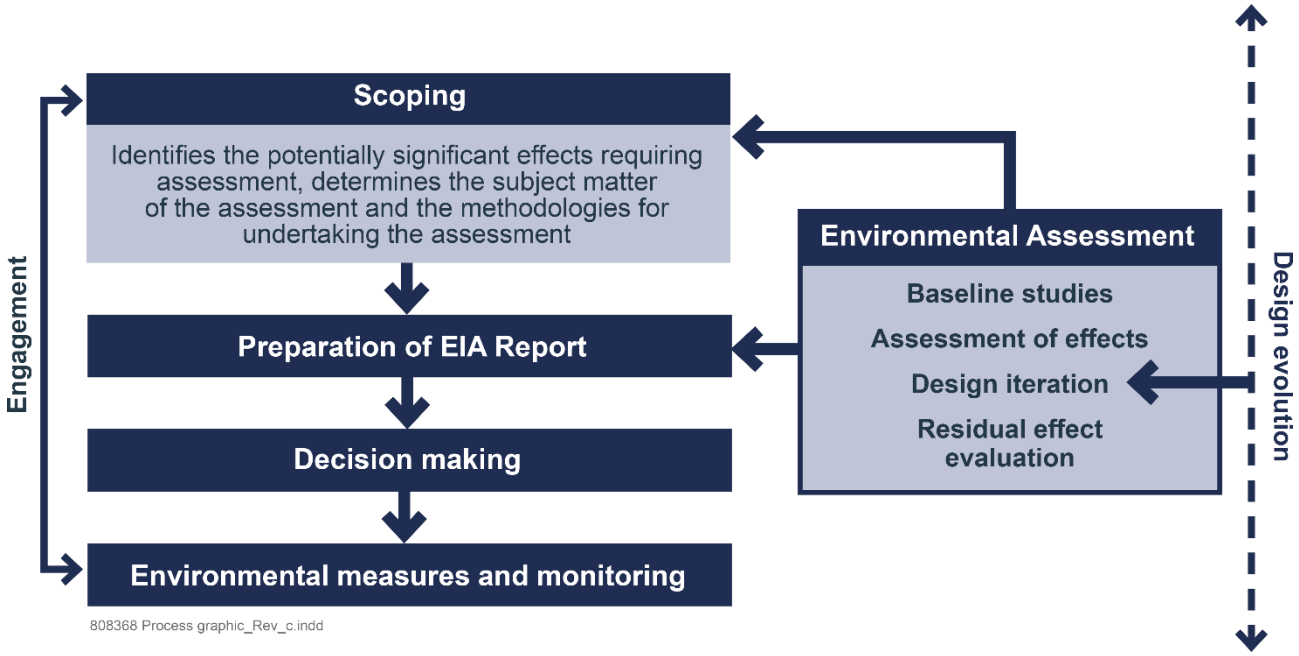
4.1.1.3 The purpose of the environmental assessment presented in the EIA Report is to enable members of the public, consultation bodies, and other stakeholders, to develop an informed view of the likely significant effects of the Project, and comment on aspects of interest. The Applicant has worked with stakeholders to develop additional ways in which the negative effects of the Project, identified by this assessment, can be avoided or reduced.

4.1.1.4 The full findings of the EIA process is presented in this EIA Report that is submitted as part of the applications for consent. The EIA Report provides the public and relevant organisations (such as MD-LOT, Aberdeenshire Council, Scottish Environment Protection Agency, NatureScot and Historic Environment Scotland) with the environmental information needed to understand and comment on a development and provides decision-makers with the environmental information to allow a decision to be made on whether to grant consent for the development.

4.1.1.5 The EIA process is summarised in **Plate 10**.

4.1.1.6 Further details about the EIA process are described in **Volume 1, Chapter 5: Approach to the EIA** of the EIA Report.

Plate 10 The EIA process



4.2 Consultation and engagement

4.2.1.1 Statutory Consultation and stakeholder engagement has been undertaken in line with and exceeding legislative requirements. Throughout four Statutory Consultation periods and wider engagement, statutory consultees, stakeholders and other interested parties had the opportunity to learn more about the Project, share their views and engage in dialogue with the Applicant.

4.2.2 Pre-consultation engagement

4.2.2.1 In 2023, the Applicant held a Scoping Opinion consultation and drop-in day. This non-statutory event included an introductory hour for stakeholders followed by a public drop-in session. The aim was to introduce the Project to the local community and gather initial feedback ahead of Statutory Consultation.

4.2.3 EIA Scoping Report

4.2.3.1 An EIA Scoping Report was submitted to Aberdeenshire Council and MD-LOT in January 2023. The Scoping Report identified the potentially significant effects requiring assessment, determined the subject matter of the assessment and the methodologies for undertaking the assessment. Aberdeenshire Council and MD-LOT subsequently provided Scoping Opinions in March and May 2023 respectively, which included comments from a range of stakeholders on the proposed scope of the EIA. The Scoping Opinions and the statutory consultee responses have subsequently informed the assessment work and further design evolution undertaken to date.

4.2.4 Statutory Consultation

First Statutory Consultation

4.2.4.1 The first round of Statutory Consultation took place between 27 May 2024 and 1 July 2024, including two in-person drop-in events, two online Question and Answer (Q&A) sessions, and a virtual exhibition space, supported by a range of accessible consultation materials. These events were widely promoted through leaflets, local press, radio and social media to ensure broad awareness and participation.

4.2.4.2 Stakeholders were able to view project information, ask questions, and submit feedback through online and hardcopy questionnaires, email, and at events. All responses were carefully reviewed and analysed.

Second Statutory Consultation

4.2.4.3 The second round of Statutory Consultation took place between 9 October 2024 and 19 November 2024, including two in-person drop-in events, two online Q&A sessions, and a virtual exhibition space, supported by a range of accessible consultation materials. These events were widely promoted through leaflets, local press, radio, social media, and direct correspondence to ensure broad awareness and participation.

4.2.4.4 Consultation materials were shared, which demonstrated how the Project had developed. The Project team published a “you said, we did” summary to demonstrate how feedback during the first Statutory Consultation had influenced the Project.

Third Statutory Consultation

4.2.4.5 The original strategy allowed for two rounds of Statutory Consultation in 2024 and further information days in 2025. As the project planning application submission date exceeded 18 months after the Proposal of Application Notice had been submitted a new notice was submitted, and two further rounds of Statutory Consultation were held in 2025. The additional rounds of consultation provided further opportunities for stakeholders to receive Project updates, understand how their feedback has shaped the Project and provide further feedback.

4.2.4.6 The third round of Statutory Consultation was held between 18 August 2025 and 9 September 2025. The consultation included an in-person drop-in event and a virtual exhibition space, supported by a range of accessible consultation materials. This included a summary of how the Project had responded to feedback from the second Statutory Consultation.

Fourth Statutory Consultation

4.2.4.7 The fourth round of Statutory Consultation was held between 30 October 2025 and 13 November 2025, including an in-person drop-in event and a virtual exhibition space. Consultation materials included an overview of all stakeholder feedback across the previous three rounds of consultation, and how it has been considered in project developments.

4.3 The EIA process

4.3.1.1 EIA is a process for identifying the likely significant environmental effects (positive and negative) of a Project to inform the decision-making process for consent to be granted. A full description is provided in **Volume 1, Chapter 5: Approach to the EIA** of the EIA Report.

4.3.1.2 The EIA considers all relevant 'aspects' that may be impacted both onshore and offshore, such as landscape and visual, marine mammals, commercial fisheries and archaeology and cultural heritage. The aspects to be included in the EIA were agreed with Aberdeenshire Council and MD-LOT and other stakeholders through the Scoping process.

4.3.1.3 The EIA Report presents the EIA findings. A separate EIA Report Chapter presents the detailed findings for each aspect that has been assessed. **Volume 1** of the EIA Report, details all the EIA Report chapters:

- **Chapters 6** to **18** detail the offshore chapters,
- **Chapters 19** to **27** detail the onshore chapters; and
- **Chapters 28** to **33** detail the 'whole Project' chapters.

4.3.1.4 A detailed description of the existing 'baseline environment' has been produced for the offshore and onshore development areas, through a combination of desk-based studies, consultation and site-specific surveys.

4.3.1.5 All 'potential effects' arising from the construction, O&M and decommissioning of the Project are identified as part of the EIA methodology, for example loss of habitat or change in noise levels. The assessment considers the level of significance of each effect on each 'receptor' (the receiving environment such as water, air, land, and specific species). The assessment is undertaken by EIA specialists such as ecologists and marine scientists. The general approach to determining 'significance' of an effect is to consider the sensitivity of a receptor alongside the nature and severity of the change. A detailed explanation of how different effects are deemed significant for each aspect is provided in each chapter of the EIA Report.

4.3.1.6 All potential effects are considered as part of the EIA process. However, 'likely significant effects' are the key issues that are identified when considering the level and type of effect and the sensitivity of the environmental receptor.

4.3.1.7 The EIA Report also includes a consideration of potential cumulative, transboundary and inter-related effects:

- cumulative effects are the combined effect of the Project in combination with the effects from a number of different projects, on the same single environmental receptor / resource;;
- inter-related effects are those that arise from multiple impacts and activities from the construction, O&M, and decommissioning of the Project on the same receptor, or group of receptors; and
- transboundary effects are where there is the potential for the Project to affect the environment of another European Economic Area state.

4.4 Maximum design scenario

4.4.1.1 In order to establish the scope of environmental assessment, the EIA Report assessed the Project based on what is termed a parameter-based design envelope approach or 'Rochdale Envelope' approach. Assessing the environmental effects using a parameter-based design envelope approach is well-established for large scale infrastructure projects and means that the assessment will consider a maximum design scenario whilst allowing the flexibility to make improvements in the future in ways that cannot be predicted at the time of submission of the application. Such design decisions for the Project may include the precise model and dimensions of WTG model that will be available at the time of procurement for the Project, or the final optimised layout taking into account detailed

engineering factors and wind energy optimisation. Development permitted by the consents will not extend beyond the clearly defined parameters assessed in the EIA Report.

4.4.1.2 The findings presented in the EIA Report are based on assessment of effects based on the baseline conditions and a maximum design scenario which allows for conclusions as to the likely significant environmental effect to be drawn. A precautionary approach is applied to ensure a reasonable worst-case or maximum design scenario is assessed in the EIA Report.

4.5 Embedded environmental measures

4.5.1.1 EIA is an iterative process and opportunities for environmental mitigation, referred to as 'embedded environmental measures' have been considered throughout the design development of the Project and in the assessment undertaken for the EIA. Where possible, these measures have been developed with input from key stakeholders together with appropriate technical standards, policies and guidance. These embedded environmental measures include both avoidance, best practice and design commitments.

4.6 Reporting EIA assessment results

4.6.1.1 The EIA process culminates in the provision of an EIA Report written in accordance with the EIA Regulations. It provides an assessment of the likely significant effects associated with the construction, O&M, and decommissioning stage of the Project, which will help to inform the determination of the applications for consent.

4.6.1.2 The EIA Report is comprised of:

- **Non-Technical Summary** (this document);
- **Volume 1**: EIA Report chapters with all the full details of methodology and assessments;
- **Volume 2**: Figures to accompany each EIA Report chapter;
- **Volume 3**: Appendices where further information is presented in relation to the EIA Report chapters; and
- **Volume 4**: Implementation plans.

5. Offshore Environmental Assessment

5.1 Introduction

5.1.1.1 This Section provides a summary of the assessment of likely significant effects to offshore resources and receptors including:

- marine geology, oceanography and physical processes;
- marine water and sediment quality;
- underwater noise;
- electromagnetic fields;
- benthic, epibenthic and intertidal ecology;
- marine mammals;
- offshore and intertidal ornithology;
- fish ecology;
- commercial fisheries;
- shipping and navigation;
- marine archaeology and cultural heritage;
- seascape, landscape and visual; and
- infrastructure and other marine users.

5.2 Marine geology, oceanography and physical processes

5.2.1 Overview

5.2.1.1 This Section summarises the assessment findings for marine geology, oceanography and physical processes, based on **Volume 1, Chapter 6: Marine Geology, Oceanography and Physical Processes** of the EIA Report.

5.2.1.2 **Volume 1, Chapter 6: Marine Geology, Oceanography and Physical Processes** of the EIA Report examines the likely potential changes to marine geology, oceanography and physical processes due to the construction, O&M, and decommissioning of the Project.

5.2.1.3 The assessment has considered impact on / changes to:

- metocean regimes:
  - water levels;
  - currents;
  - wind and waves; and
  - stratification and frontal systems.
- sediments, morphology, sediment transport and seabed mobility; and
- coastlines, beaches and nearshore processes.

5.2.1.4 In order to determine the magnitude of change to these aspects of the marine physical environment, a range of assessment techniques have been used. These include numerical modelling of wave blockage arising from the presence of floating units and other Project infrastructure, standard empirical equations (including those describing the potential for wind turbine foundation structures to change turbulent kinetic energy and therefore water column stratification), spreadsheet based tools for determining the extent and concentration of sediment plumes produced from installation activities, as well as the evidence from analogous projects including other offshore wind farms and subsea cables.

5.2.1.5 A series of baseline geophysical, metocean and inter-tidal benthic surveys have been undertaken to inform the assessment, which has been carried out in accordance with industry standards and guidance.

5.2.1.6 The following organisations have been consulted: Aberdeenshire Council, NatureScot and MD-LOT.

5.2.2 Embedded environmental measures

5.2.2.1 A range of environmental measures within **Volume 3, Appendix 5.2: Commitments Register** which relate to marine geology, oceanography and physical processes are embedded as part of the Project design to remove or reduce significant environmental effects as far as possible.

5.2.2.2 Examples of these embedded environmental measures include the following:

- use of a trenchless landfall installation method;
- implementation of a scour protection management plan; and
- preference for cable burial.

5.2.3 Likely significant effects

Overview

5.2.3.1 No significant effects have been identified in relation to potential effects of the Project on marine geology, oceanography and physical processes from construction, O&M and decommissioning of the Project.

Inter-related effects

5.2.3.2 No significant inter-related effects of greater significance compared to the effects considered alone were identified for marine geology, oceanography and physical processes receptors from the construction, O&M and decommissioning of the Project.

Transboundary effects

5.2.3.3 No significant transboundary effects have been identified at this stage in relation to the Project on marine geology, oceanography and physical processes receptors from construction, O&M, and decommissioning activities.

Cumulative effects

5.2.3.4 No significant cumulative effects have been identified in relation to potential effects of the Project on marine geology, oceanography and physical processes from construction, O&M, and decommissioning of the Project.

5.3 Marine water and sediment quality

5.3.1 Overview

5.3.1.1 **Volume 1, Chapter 7: Marine Water and Sediment Quality** of the EIA Report examines the likely significant effects that may be experienced on marine sediment and water quality due to the construction, O&M, and decommissioning of the Project.

5.3.1.2 The assessment has considered the likely significant marine water and sediment quality effects of the Project from the following sources: mobilisation of sediments and associated contaminant, resettlement of mobilised sediment, release of drilling fluids, leachate of contaminants, and a change in blue carbon resources in seabed sediments, during construction and decommissioning. As well as the mobilisation of sediments and associated contaminants, resettlement of mobilised sediment, leachate of contaminants, and breakdown of thermal stratification during O&M.

5.3.1.3 The marine sediment and water quality assessment considers the effects on marine sediment and water quality receptors. Changes in water or sediment quality predicted by the EIA can only be assessed directly for significance of effect where there is a water or sediment environmental quality standard established for protection of the aquatic environment. Where no environmental quality standards are available, changes to sediment and water quality may have indirect effects on receptors considered in other chapters, and changes to the pathway of effects on other receptors are assessed here instead.

5.3.1.4 MD-LOT has been consulted in the production of **Volume 1, Chapter 7: Marine Water and Sediment Quality**.

5.3.2 Embedded environmental measures

5.3.2.1 A range of environmental measures within the **Volume 3, Appendix 5.2** which relate to water and sediment quality are embedded as part of the Project design to remove or reduce significant environmental effects as far as possible.

5.3.2.2 Examples of these embedded environmental measures include the following:

- A **Volume 4: Outline Marine Pollution Contingency Plan** (MPCP) (Appendix to the **Environmental Management Plan** (EMP)) has been submitted with this Application. This Outline MPCP outlines details of procedures to protect personnel working and to safeguard the marine environment and mitigation measures in the event of an accidental pollution event arising from offshore operations relating to the Project. The Final MPCP will be completed prior to construction commencing and submitted to MD-LOT for approval and will include relevant key emergency contact details.
- A **Volume 4: Outline Project Environmental Monitoring Programme** (PEMP) has been submitted with this Application. The Final PEMP will be completed prior to construction commencing and submitted to MD-LOT for approval. The Final PEMP will set out commitments to environmental monitoring in pre-, during and post-construction stages of the Project.

- A detailed CBRA will be undertaken to enable informed judgements about burial depth. This should reduce the risk of buried cables reemerging whilst also limiting the amount of sediment disturbance to that which is necessary. The array and export cables will typically be buried at a target burial depth between 1m to 2m below the seabed surface. The final depth of the cable will be dependent on the seabed mobility and CBRA. The CBRA will manage and mitigate risks from loading and sediment transport across the seabed. The CBRA will be included within the Final Cable Plan.
- Micro-siting will be applied to proposed offshore Project infrastructure such as cables (trenched or ploughed in), or WTG anchor structures, to minimise mobilisation of contaminants from any areas of significantly contaminated sediment detected during pre-construction surveys.
- Turbidity in the water column caused by sediment mobilisation during construction will be controlled by selection of best practice construction methods.
- The Project will ensure that any material to be deposited in the sea (metal components, rock for armour, concrete mattresses) does not contain toxic materials that could leach into the sea water and result in toxic effects.

5.3.3 Likely significant effects

Overview

5.3.3.1 No significant effects have been identified in relation to potential effects of the Project on water and sediment quality from construction, O&M and decommissioning of the Project.

Inter-related effects

5.3.3.2 No significant inter-related effects of greater significance compared to the effects considered alone were identified for water and sediment quality receptors from the construction, O&M and decommissioning of the Project.

Transboundary effects

5.3.3.3 No significant transboundary effects have been identified at this stage in relation to the Project on water and sediment quality receptors from construction, O&M, and decommissioning activities.

Cumulative effects

5.3.3.4 No significant cumulative effects have been identified in relation to potential effects of the Project on water and sediment quality from construction, O&M, and decommissioning of the Project.

5.4 Underwater noise

5.4.1 Overview

5.4.1.1 **Volume 1, Chapter 8: Underwater Noise** of the EIA Report presents the results of the underwater noise modelling assessment. The assessment informs the impact assessments in **Volume 1, Chapter 10: Benthic, Epibenthic and Intertidal Ecology**, **Volume 1,**

Chapter 11: Marine Mammals, **Volume 1, Chapter 13: Fish Ecology**, **Volume 1, Chapter 14: Commercial Fisheries** and **Volume 1, Chapter 30: Socio-economics**.

5.4.1.2 The underwater noise modelling (see **Volume 3, Appendix 8.1: Underwater Noise Modelling Assessment**) considered the likely noise outputs from impact pile driving at a single location and at two locations piled concurrently, other noise associated with activities in the construction, O&M, and decommissioning stages, noise from operational WTGs, noise from mooring cables and noise from the clearance of unexploded ordnance (UXOs).

5.4.1.3 In line with guidance for noise exposure criteria, the effects in terms of impact ranges or areas where impacts could occur were then calculated for marine mammals and fishes.

5.4.1.4 The North Sea is one of the busiest maritime areas in the world, with ambient noise levels predominantly influenced by shipping and wind.

5.4.1.5 Underwater noise modelling predicted the largest auditory injury (permanent threshold shift) impact range and area for marine mammals at 25km and 1,600km^2, respectively, for low-frequency cetaceans, for sequential piling at a single location. The impact area for concurrent piling of two locations was 4,100km^2 for low-frequency cetaceans.

5.4.1.6 Underwater noise modelling predicted the largest recoverable injury impact range and area for fishes with swim bladders at 4.9km and 175km^2, respectively, for stationary animals, reducing to less than 100m and less than 0.1km^2, respectively, for fleeing animals, for sequential piling at a single location. The impact area for concurrent piling of two locations was 170km^2 for stationary animals, reducing to less than 0.1km^2 for fleeing animals.

5.4.1.7 Other noise-producing activities were predicted to give impact ranges of up to 1.1km for very-high-frequency cetaceans and 130m for low-frequency cetaceans over a 24-hour period. Recoverable injury of stationary fishes was predicted over a time period of 48 hours to have a range of less than 50m. Operational WTGs and the tension-related sounds produced by mooring cables were considered to produce noise levels well below the thresholds for auditory injury of marine mammals or recoverable injury for fishes.

5.4.1.8 The clearance of UXOs was modelled for a range of explosive charge sizes, and for both deflagration (low-order) and high-order detonation techniques. For marine mammals, impact ranges were highest for very-high-frequency cetaceans, up to 15km for the largest device (907 kilograms plus donor charge) and up to 12km for low-frequency cetaceans. Mortality and potential mortal injury of fishes was predicted for a range of up to 970m. Given that sound loses its impulsive nature with increasing distance from source and that a high-order technique would only be used under exceptional circumstances, these ranges present a highly conservative estimate of the worst-case scenario for UXO clearance.

5.4.1.9 NatureScot and MD-LOT were consulted with regard to the underwater noise modelling assessment methodology.

5.4.2 Embedded environmental measures

5.4.2.1 A range of environmental measures within **Volume 3, Appendix 5.2** that relate to underwater noise are embedded as part of the Project design to remove or reduce significant environmental effects as far as possible.

5.4.2.2 Examples of these embedded environmental measures include the following:

- A **Volume 4: Outline Marine Mammal Mitigation Protocol** to mitigate potential impacts from underwater noise on marine mammals and fishes, through best practice actions; and

- implementation of noise mitigation and best practice techniques secured via the **Volume 4: Outline Environmental Management Plan**.

5.4.3 Likely significant effects

5.4.3.1 Likely significant effects, inter-related, transboundary and cumulative effects of underwater noise are assessed in the relevant chapters referenced in **Section 5.4.1** above, and not in **Volume 1, Chapter 8: Underwater Noise**.

5.5 Electromagnetic fields

5.5.1 Overview

5.5.1.1 **Volume 1, Chapter 9: Electromagnetic Fields** of the EIA Report describes and analyses the EMF produced by the Project's electrical cables. EMF occur naturally on Earth but can also be created by electricity moving through cables. While the design of modern cables prevents electrical fields from escaping, magnetic fields can extend into the surrounding environment, although their strength quickly decreases with distance.

5.5.1.2 For the Project, EMF from cables would only be present during operation and live maintenance as this is when the cables are carrying electricity. The analysis focused on offshore cables as these represent a worst case that can be made applicable for the onshore cable scenario at watercourse crossings in relation to potential effects on freshwater fish. Onshore equipment (such as onshore substations) was scoped out of the assessment in relation to human health, as the human health will be protected via the Project's adherence to all relevant health and safety legislation, and onshore EMF emissions will be within the occupational exposure guidelines.

5.5.1.3 Specialist EMF modelling was used to calculate the maximum worst case EMF emissions from the Project's offshore cables, taking into account different cable types, power levels, and burial depths. In the analysis, the electromagnetic emissions from the various conductors within the offshore cables were determined. Analytical modelling based on Biot-Savart theory was used in calculating the magnetic fields produced by the conductors. This was implemented in MATLAB software. As each current carrying conductor will be enclosed in a metallic screen, no direct electric fields are expected.

5.5.1.4 The calculations were performed for the following circuits: 66kV alternating current (AC) array cables, HVDC export cables (including 230kV monopole and 525kV bipole configuration), and 275kV HVAC export cables. The results show that areas where EMF levels are above natural background levels are very close to the cables (generally within less than one metre, to several metres) meaning any effects are likely to be localised.

5.5.1.5 **Volume 1, Chapter 9: Electromagnetic Fields** does not assess impacts to specific receptors or receptor groups. The EMF analysis instead informs **Volume 1, Chapter 10: Benthic, Epibenthic and Intertidal Ecology, Volume 1, Chapter 11: Marine Mammals, Volume 1, Chapter 12: Offshore and Intertidal Ornithology, Volume 1, Chapter 13: Fish Ecology, Volume 1, Chapter 14: Commercial Fisheries**, and **Volume 1, Chapter 23: Terrestrial Ecology and Ornithology** where receptors to EMF are identified and any resultant impacts are assessed.

5.5.1.6 The baseline for EMF is characterised by the Earth's naturally-occurring electric and magnetic fields. The Earth's magnetic field ranges globally from 25μT to 65μT, and is currently approximately 50μT in the United Kingdom, including in Scotland within the Project Red Line Boundary both onshore and offshore. No site specific baseline surveys have been

undertaken to inform the analysis as the Earth's naturally-occurring electric and magnetic fields are mapped by the National Oceanic and Atmospheric Administration (NOAA, 2025).

5.5.1.7 The following organisations have been consulted: MD-LOT, NatureScot, Dee District Salmon Fishery Board, and Ugie District Salmon Fishery Board.

5.5.2 Embedded environmental measures

5.5.2.1 Overall, the analysis indicates the likely strength and location of EMF from the Project in the aquatic environment. This has been used to inform the consideration of potential effects from EMF on sensitive species within wider relevant EIA Report chapters and ensures that EMF is considered and managed as part of the Project's environmental commitments. A range of environmental measures within **Volume 3, Appendix 5.2** that relate to EMF are embedded as part of the Project design to remove or reduce significant environmental effects as far as possible.

5.5.2.2 Examples of these embedded environmental measures include the following:

- submission of **Volume 4: Outline Scour Protection Plan**;
- a detailed CBRA will be undertaken to inform cable burial depths;
- cables will be buried where possible and / or protected by external cable protection such as rock placement and / or concrete mattressing; and
- onshore EMF will be managed through adherence to occupational exposure guidelines.

5.5.3 Likely significant effects

5.5.3.1 Likely significant effects, inter-related, transboundary and cumulative effects of EMF are assessed in the relevant chapters referenced above, and not in **Volume 1, Chapter 9: Electromagnetic Fields**.

5.6 Benthic, epibenthic and intertidal ecology

5.6.1 Overview

5.6.1.1 **Volume 1, Chapter 10: Benthic, Epibenthic and Intertidal Ecology** of the EIA Report examines the likely significant effects that may be experienced by benthic and epibenthic ecology receptors as a result of the Project due to the construction, O&M, and decommissioning of the Project seaward of MHWS.

5.6.1.2 The assessment has considered the likely significant effects of the Project from the following sources: construction of the offshore elements of the Project including infrastructure associated with the offshore export cable corridor and OAA.

5.6.1.3 Within the EIA Scoping stage of assessment, fish and shellfish were assessed within one chapter. However, fish now sits in **Volume 1, Chapter 13: Fish Ecology** and shellfish receptors are assessed within that chapter.

5.6.1.4 The assessment has considered the potential effects on benthic receptors including but not limited to: disturbance of seabed habitat, temporary increase in suspended sediment and deposition, mobilisation of sediment associated contaminants, introduction or spread of marine Invasive Non-Native Species (INNS), underwater noise and vibration, long-term habitat loss, creation of areas of hard substrate, and EMF generated by array and export cables.

5.6.1.5 The spatial extent of the benthic, epibenthic and intertidal ecology assessment encompasses the Offshore Red Line Boundary (including the OAA and offshore export cable corridor) as well as a secondary zone of influence (ZOI). The secondary ZOI reflects a buffer area extending 15km around the offshore export cable corridor and OAA and represents the area within which suspended sediments may disperse following Project-related seabed disturbance.

5.6.1.6 A combination of site-specific surveys and desk-based studies have been used to inform the benthic and epibenthic ecology baseline. Online data resources were utilised such as seabed substrate data, habitat mapping and EIA chapters for nearby wind farms. This information was supplemented by evidence from geophysical and environmental surveys specific to the export cable corridor, array area, and intertidal areas of the Project.

5.6.1.7 The following organisations have been consulted: NatureScot, Aberdeenshire Council, MD-LOT and Marine Science Scotland.

5.6.2 Embedded environmental measures

5.6.2.1 A range of environmental measures within **Volume 3, Appendix 5.2** that relate to benthic and epibenthic ecology are embedded as part of the Project design to remove or reduce significant environmental effects as far as possible.

5.6.2.2 Examples of these embedded environmental measures include the following:

- A **Volume 4: Outline Offshore Invasive Non-Native Species** (INNS) **Management Plan** has been submitted with this Application. The Final Offshore INNS Management Plan will be completed prior to construction commencing and submitted to MD-LOT for approval. The Final Offshore INNS Management Plan will include management measures to limit the risk of INNS being introduced to the marine environment.
- A **Volume 4: Outline Piling Strategy** has been submitted with this Application. The Final Piling Plan will be completed prior to construction commencing and submitted to MD-LOT for approval. It will detail the methods of pile installation and associated underwater noise levels. It will describe any mitigation measures to be implemented (e.g. soft start and ramp up measures, or the use of acoustic deterrent devices) prior to and during pile installation to manage the effects of underwater noise.

5.6.3 Likely significant effects

Overview

5.6.3.1 No significant effects have been identified in relation to potential effects of the Project on benthic, epibenthic and intertidal ecology receptors from construction, O&M and decommissioning stages of the Project.

Inter-related effects

5.6.3.2 No significant inter-related effects of greater significance compared to the effects considered alone were identified for benthic ecology receptors from the construction, O&M and decommissioning stages of the Project.

Transboundary effects

5.6.3.3 No significant transboundary effects have been identified at this stage in relation to the Project on benthic ecology receptors from construction, O&M, and decommissioning stages of the Project.

Cumulative effects

5.6.3.4 No significant cumulative effects have been identified in relation to potential effects of the Project on benthic ecology receptors from construction, O&M and decommissioning stages of the Project.

5.7 Marine mammals

5.7.1 Overview

5.7.1.1 **Volume 1, Chapter 11: Marine Mammals** of the EIA Report evaluates the potential significant effects on marine mammals arising from the construction, O&M, and decommissioning stages of the Project. The assessment centres on marine mammal populations present within and around the development area, situated in the northern North Sea, an ecologically important region that supports a diverse range of cetaceans (whales, dolphins, and porpoises) and two seal species.

5.7.1.2 Marine mammal distribution in this region is closely tied to the availability of prey, primarily fish, and is inherently variable due to the highly mobile nature of these species. The assessment focuses on key species known to frequent the area.

5.7.1.3 The key species informing the assessment were:

- harbour porpoise (*Phocoena phocoena*);
- bottlenose dolphin (*Tursiops truncatus*);
- short-beaked common dolphin (*Delphinus delphis*);
- white-beaked dolphin (*Lagenorhynchus albirostris*);
- Risso's dolphin (*Grampus griseus*);
- Atlantic white-sided dolphin (*Lagenorhynchus acutus*);
- minke whale (*Balaenoptera acutorostrata*);
- humpback whale (*Megaptera novaeangliae*);
- grey seal (*Halichoerus grypus*); and
- harbour seal (*Phoca vitulina*).

5.7.1.4 The environmental baseline was established through a combination of desk-based research, site-specific data collection, monthly digital aerial surveys, passive acoustic monitoring, and marine mammal observer records. A comprehensive account of the baseline data is provided in **Volume 3, Appendix 11.1: Marine Mammal Baseline Technical Report**.

5.7.1.5 Although the Project does not fall within any designated marine mammal protected areas, the offshore export cable corridor intersects with the Southern Trench Nature Conservation Marine Protected Area (NCMPA), which is designated for minke whale.

5.7.1.6 Among cetaceans, harbour porpoise was the most frequently observed species during aerial surveys, particularly in Summer months (June to August). White-beaked dolphins were also regularly recorded during this period, while Risso's dolphins were observed less frequently. Bottlenose dolphins in the region are part of a resident east coast population that typically occupies inshore waters, although an offshore population is also known to occur. Grey seals were recorded during aerial surveys, albeit in low numbers, while both grey and harbour seals are known to haul out along the coast and forage offshore.

5.7.1.7 The assessment identified several potential impacts on marine mammals across all stages of the Project. These include:

- auditory injury and behavioural disturbance from elevated underwater noise during construction activities, including UXO clearance and piling, as well as and other pre-construction and construction activities;
- risk of physical injury and behavioural disruption due to increased vessel traffic;
- indirect effects resulting from changes in prey availability;
- operational noise, EMF from subsea cables, and collision risk associated with floating WTGs;
- potential for entanglement in cables and mooring lines, including primary, secondary, and tertiary entanglement scenarios; and
- long-term habitat alteration, displacement, and barrier effects caused by the presence of offshore infrastructure.

5.7.2 Embedded Environmental Measures

5.7.2.1 A range of environmental measures within **Volume 3, Appendix 5.2** that relate to marine mammals are embedded as part of the Project design to remove or reduce significant environmental effects as far as possible.

5.7.2.2 Examples of these embedded environmental measures include the following:

- Submission of **Volume 4: Outline Scour Protection Plan**.
- Submission of **Volume 4: Outline Marine Mammal Mitigation Protocol (MMMP)**.
- Submission of **Volume 4: Outline Marine Pollution Contingency Plan** (MPCP) as an Appendix to the **Environmental Management Plan** (EMP).
- Submission of **Volume 4: Outline Vessel Management and Navigational Safety Plan**.
- Development of a detailed Cable Burial Risk Assessment (CBRA).
- Burial of the cables where possible and / or use of external cable protection such as rock placement and / or concrete mattressing.
- Submission of **Volume 4: Outline Piling Strategy**.
- The development of and adherence to a Decommissioning Programme.
- Use of 'low order' techniques such as deflagration for UXO disposal, where possible and required.
- The development of an UXO Management Plan.
- Submission of **Volume 4: Outline Construction Method Statement**.

- Submission of **Volume 4: Outline Environmental Management Plan** (EMP).
- Development of and adherence to an Offshore Operations and Maintenance Plan.

5.7.3 Likely significant effects

Overview

5.7.3.1 No significant effects have been identified in relation to all potential impacts assessed resulting from the Project throughout the construction, O&M and decommissioning stages of the Project.

Inter-related effects

5.7.3.2 No significant inter-related effects of greater significance compared to the effects considered alone were identified for all potential impacts assessed resulting from the Project throughout the construction, O&M and decommissioning stages of the Project.

Transboundary effects

5.7.3.3 No significant transboundary effects have been identified at this stage in relation to all potential impacts assessed resulting from the Project throughout the construction, O&M and decommissioning stages of the Project.

Cumulative effects

5.7.3.4 No significant cumulative effects have been identified in relation to all potential impacts assessed resulting from the Project throughout the construction, O&M and decommissioning stages of the Project.

5.8 Offshore and intertidal ornithology

5.8.1 Overview

5.8.1.1 **Volume 1, Chapter 12: Offshore and Intertidal Ornithology** of the EIA Report evaluates the potential significant effects on offshore and intertidal ornithology receptors arising from the construction, O&M, and decommissioning stages of the offshore Project seaward of MHWS.

5.8.1.2 Offshore ornithology receptors are primarily species colloquially referred to as seabirds, this aggregate term is used to describe birds that are well adapted to the marine environment and spend much of their time at sea and / or near the coast. Intertidal ornithology receptors can be made up of both seabirds and waterbirds, this aggregate term is used in reference to birds that are well adapted to the intertidal environment and spend much of their time at the coast.

5.8.1.3 The assessment focuses on seabird populations present within and around the development area, situated in the northern North Sea, an ecologically important region that supports a diverse range of both breeding and non-breeding seabird populations. Due to the mobile nature of seabirds, a combination of site-specific surveys (24 months of digital aerial surveys for offshore ornithology and 12 months of vantage point surveys for intertidal ornithology) and desk-based studies have been used to inform the environmental baseline.

A comprehensive account of the baseline data is provided in **Volume 3, Appendix 12.1: Offshore and Intertidal Ornithology Baseline Report**.

5.8.1.4 During the 24 digital aerial surveys undertaken across the OAA plus 4km buffer between April 2021 and March 2023, a total of 20,494 individual birds were recorded. A total of 17 seabird species were recorded, with guillemot *Uria aalge*, fulmar *Fulmarus glacialis*, gannet *Morus bassanus*, kittiwake *Rissa tridactyla* and razorbill *Alca torda* as the most frequently encountered species. These five species accounted for 95.3% of all birds recorded; guillemot (53.4%), fulmar (28.5%), gannet (6.5%), kittiwake (4.1%), and razorbill (2.8%).

5.8.1.5 Twelve vantage points surveys were completed for the short-listed landfall areas of Scotstown beach and Lunderton (North and South) between September 2022 to August 2023. For Scotstown beach, important numbers of Sandwich tern *Thalasseus sandvicensis*, guillemot and shag *Phalacrocorax aristotelis* were recorded, alongside notable numbers of eider *Somateria mollissima*, common gull *Larus canus*, Arctic tern *Sterna paradisaea*, razorbill, gannet and wader species. At Lunderton (North and South), important numbers of eider, herring gull *Larus argentatus*, guillemot and shag were recorded, alongside notable numbers of common scoter *Melanitta nigra* and razorbill.

5.8.1.6 The assessment has considered the potential effects on offshore and intertidal receptors across the different stages of the Project. These included:

- direct temporary habitat loss / disturbance;
- indirect impacts due to effects on prey species and habitats;
- distributional response effects;
- collision risk; and
- entanglement with mooring lines.

5.8.1.7 The following organisations were consulted to define the approach taken to assessments: NatureScot, Royal Society for the Protection of Birds (RSPB), Natural England and MD-LOT.

5.8.2 Embedded environmental measures

5.8.2.1 A range of environmental measures within **Volume 3, Appendix 5.2** which relate to offshore and intertidal ornithology are embedded as part of the Project design to remove or reduce significant environmental effects as far as possible.

5.8.2.2 An example of these embedded environmental measures include:

- To reduce environmental impact of the landfall, a trenchless solution (e.g. HDD) is to be implemented to install ducts at landfall. The use of HDD minimises disturbance in the intertidal zone, and hence impacts to intertidal bird species.

5.8.3 Likely significant effects

Overview

5.8.3.1 The potential for a significant effect was identified from the Project alone from distributional response effects during the O&M stage in relation to guillemot. No feasible mitigation was identified which would confidently reduce the residual effect significance to that of non-significance overall. The Project has provided potential options for compensation with respect to guillemot, as presented within the **Derogation Case**.

5.8.3.2 For all other receptors and effect pathways identified, the potential for a significant effect from the Project alone was confidently ruled out for all Project stages.

Inter-related effects

5.8.3.3 No significant inter-related effects of greater significance compared to the effects considered alone were identified for offshore and intertidal ornithology receptors from the construction, O&M and decommissioning of the Project.

Transboundary effects

5.8.3.4 No material transboundary effects have been identified in relation to the Project on offshore and intertidal ornithology receptors from construction, O&M, and decommissioning activities.

Cumulative effects

5.8.3.5 As presented within **Volume 3, Appendix 33.4: Offshore and Intertidal Ornithology CEA**, a number of potentially significant cumulative effects were identified from:

- distributional response effects during the O&M stage in relation to guillemot, razorbill and puffin;
- collision risk during the O&M stage in relation to kittiwake and great black-backed gull; and
- combined effects during the O&M stage in relation to kittiwake and gannet.

5.8.3.6 The reason for the significant effect conclusions is primarily due to the pre-existing scale of predicted impact from other developments, rather than due to the Project's contribution to the CEA. The Project has provided potential options for compensation with respect to kittiwake, guillemot, razorbill, puffin and gannet as presented within the **Derogation Case**. For great black-backed gull, the Project has proposed further monitoring to better understand the actual impact from the Project alone due to concerns that compensating for great black-backed gull may pose in relation to their impacts on other seabirds.

5.9 Fish ecology

5.9.1 Overview

5.9.1.1 **Volume 1, Chapter 13: Fish Ecology** of the EIA Report examines the likely significant effects that may be experienced by fish ecology receptors as a result of the Project due to the construction, O&M, and decommissioning of the Project seaward of MHWS.

5.9.1.2 The assessment has considered the likely significant effects of the Project from the following sources: pre-construction seabed preparation works, construction of the offshore elements of the Project (i.e. landfall seaward of MHWS, offshore export cable corridor infrastructure including offshore export cables and RCP, OAA infrastructure including the installation of offshore wind turbines, floating units, station keeping system, array cables, SDCs, subsea substations and offshore substations). During the decommissioning stage, the removal of infrastructure above and below the seabed is also considered.

5.9.1.3 Within the Scoping stage of the Project, fish and shellfish were assessed within one chapter of the Scoping Report. However, consideration of shellfish species within the EIA Report is located in **Volume 1, Chapter 10: Benthic, Epibenthic and Intertidal Ecology**.

5.9.1.4 The assessment has considered the potential effects of these activities on fish receptors, including but not limited to: increases in suspended sediment concentrations, underwater noise, vibration and particle motion, release of sediment contaminants, changes in water quality, impacts on designated sites relevant to fish, spread of INNS, secondary entanglement, temporary habitat loss and / or disturbance, colonisation of introduced hard substrate, and EMF. As detailed in the Scoping stage of the Project, impacts from accidental pollution, collision risk and primary entanglement have been scoped out of this assessment.

5.9.1.5 A precautionary 50km buffer has been applied to the study area for this assessment to encompass effects from underwater noise and disruption of migratory pathways for diadromous fish.

5.9.1.6 A combination of site-specific surveys and desk-based studies have been used to inform the fish ecology baseline. This assessment has been undertaken as a desk-based study using available, relevant datasets (including catch data, habitat mapping and EIA chapters for nearby wind farms), supplemented by evidence from site-specific marine geophysical, marine environmental, and aerial surveys undertaken to inform the Project.

5.9.1.7 The following organisations have been consulted: NatureScot, Aberdeenshire Council, MD-LOT, Dee District Salmon Fishery Board, Scottish Fishermen's Federation and Marine Science Scotland.

5.9.2 Embedded environmental measures

5.9.2.1 A range of environmental measures within **Volume 3, Appendix 5.2** which relate to fish ecology are embedded as part of the Project design to remove or reduce significant environmental effects as far as possible.

5.9.2.2 Examples of these embedded environmental measures include the following:

- A **Volume 4: Outline Offshore Invasive Non-Native Species Management Plan** has been submitted with this Application. The Final INNS Management Plan will be completed prior to construction commencing and submitted to MD-LOT for approval. The Final INNS Management Plan will include management measures to limit the risk of INNS being introduced to the marine environment.
- A **Volume 4: Outline Piling Strategy** has been submitted with this Application. The Final Piling Plan will be completed prior to construction commencing and submitted to MD-LOT for approval. It will detail the method of pile installation and associated underwater noise levels. It will describe any mitigation measures to be implemented (e.g. soft start and ramp up measures, or the use of acoustic deterrent devices) prior to and during pile installation to manage the effects of underwater noise.
- Minimise potential for creation of a temporary barrier to fish migration in any river adjacent to cable landfall(s) due to a plume of mobilised sediment obstructing the river entrance by appropriate timing of operations close to the shore regarding tidal flows and fish migration seasons.

5.9.3 Likely significant effects

Overview

5.9.3.1 No significant effects have been identified in relation to potential effects of the Project on fish ecology receptors from construction, O&M and decommissioning of the Project.

Inter-related effects

5.9.3.2 No significant inter-related effects of greater significance compared to the effects considered alone were identified for fish ecology receptors from the construction, O&M and decommissioning of the Project.

Transboundary effects

5.9.3.3 No significant transboundary effects have been identified at this stage in relation to the Project on fish ecology receptors from construction, O&M, and decommissioning activities.

Cumulative effects

5.9.3.4 No significant cumulative effects have been identified in relation to potential effects of the Project on fish ecology receptors from construction, O&M, and decommissioning of the Project.

5.10 Commercial fisheries

5.10.1 Overview

5.10.1.1 **Volume 1, Chapter 14: Commercial Fisheries** of the EIA Report considers how the construction, O&M, and eventual decommissioning of the Project may affect commercial fishing activity.

5.10.1.2 The assessment looks at potential impacts across the OAA and offshore export cable corridor, with a focus on the fishing fleets that regularly use these grounds, including demersal otter trawl, demersal seine, dredge, beam trawl, potting, pelagic trawl and purse seine, and hook and line vessels. Both UK and non-UK fleets are considered.

5.10.1.3 Fishing is a highly active and important use of the sea in this region, and there has been extensive engagement with the industry throughout the development of the Project. Fishers have consistently raised concerns about displacement, steaming times, and access to important Nephrops (*Nephrops norvegicus*) and whitefish grounds targeted for monkfish (*Lophius piscatorius*) and haddock (*Melanogrammus aeglefinus*), as well as mixed demersal species. These issues have been central to shaping the mitigation and monitoring commitments described in **Volume 1, Chapter 14: Commercial Fisheries**.

5.10.2 Embedded environmental measures

5.10.2.1 Several measures are built into the Project design to reduce potential impacts on fisheries as far as possible. These include:

- Preparing and implementing a Cable Plan to ensure cables are installed and protected in ways that reduce the risk of snagging.
- Establishing statutory Safety Zones and issuing clear Notices to Mariners and Kingfisher Bulletins so fishers have timely and accurate information.
- Preparing a Vessel Management and Navigational Safety Plan to coordinate the Project's vessel traffic.

- Maintaining strong communication and engagement with the fishing industry through a Fisheries Monitoring, Mitigation and Communication Plan, a dedicated Company Fisheries Liaison Officer, and participation in regional working groups.

5.10.3 Additional mitigation

5.10.3.1 In addition to embedded environmental measures, a package of additional commitments has been developed where more significant risks have been identified. These include:

- A Fisheries Fund to support the resilience and adaptation of the industry, including research, gear innovation and collaborative initiatives.
- An Access Corridor free of above-seabed infrastructure to maintain opportunities for demersal trawling and vessel transit.
- A fisheries monitoring programme to track changes in fishing activity, landings, and vessel behaviour, with results feeding back into adaptive management.
- Ongoing exploration of opportunities for coexistence, related to adaptive management and ensuring transparent governance of mitigation measures.

5.10.4 Significant effects

Overview

5.10.4.1 Across all Project stages, the loss of access to the OAA for the UK demersal otter trawl fleet is assessed as **Moderate Adverse** (**Significant**). While a package of mitigation has been proposed, including the Fisheries Fund, Access Corridor, fisheries monitoring, and adaptive management, these measures do not lower the residual significance, which remains **Moderate Adverse** (**Significant**) in EIA terms. The effect reflects the loss of access for fishing from established and valuable whitefish and Nephrops grounds within the OAA throughout the 12-year construction stage, 35-year operational life of each of the Project's phases, and the decommissioning stage.

5.10.4.2 No significant effects are predicted during construction or decommissioning in relation to the offshore export cable corridor, based on temporary restrictions that will be managed through embedded and additional mitigation measures. For demersal otter trawl, demersal seine, scallop dredge, and potting fleets, impacts associated with temporary loss of access to the export cable corridor during construction and decommissioning are assessed as Significant prior to mitigation, but are considered **Minor Adverse** (**Not Significant**) following implementation of the proposed mitigation measures. No significant effects are predicted at any Project stage for the export cable corridor once mitigation is applied.

5.10.4.3 Risks of displacement resulting from loss of access to both the OAA and the export cable corridor are recognised. However, these are mitigated through the Fisheries Fund, which is directed toward supporting fleet-level adaptation, diversification, and research initiatives to promote resilience and sustainability within affected fisheries.

Inter-related effects

5.10.4.4 No significant inter-related effects of greater significance compared to the effects considered alone were identified for commercial fisheries receptors from the construction, O&M and decommissioning of the Project.

Transboundary effects

5.10.4.5 No significant transboundary effects have been identified at this stage in relation to the Project on commercial fisheries receptors from construction, O&M, and decommissioning activities.

Cumulative effects

5.10.4.6 Significant cumulative effects have been identified in relation to potential effects of the Project on commercial fisheries from construction, O&M, and decommissioning of the Project due to multiple floating offshore wind farm developments leading to an incremental reduction in availability of fishing grounds, coupled with implementation of management measures within Nature Conservation Marine Protected Areas introduced outside the temporal baseline of this assessment.

5.11 Shipping and navigation

5.11.1 Overview

5.11.1.1 **Volume 1, Chapter 15: Shipping and Navigation** of the EIA Report examines the likely significant effects that may be experienced by shipping and navigation receptors, as a result of the construction, O&M, and decommissioning of the Project.

5.11.1.2 Effects have been identified based on various inputs including baseline data, consultation feedback including a Hazard Workshop gathering local and national stakeholders, quantitative modelling and expert opinion. They include:

- vessel displacement and increased vessel to vessel collision risk between third-party vessels;
- vessel to vessel collision risk between a third-party vessel and a project vessel;
- reduced access to local ports, harbours and marinas;
- loss of station;
- creation of vessel to structure allision risk (including powered, drifting and internal);
- reduction of under keel clearance as a result of cable protection, dynamic cables, and mooring lines;
- anchor interaction with mooring lines and subsea cables; and
- reduction of emergency response capability including Search and Rescue (SAR) access.

5.11.1.3 Receptors considered include commercial vessels (inclusive of oil and gas related vessels), commercial fishing vessels in transit, recreational vessels, local ports and services, and emergency responders.

5.11.1.4 Baseline data collected includes seasonal vessel traffic surveys undertaken onsite at the OAA and use of desk based sources to characterise vessel traffic movements within and in proximity to the RCP search area and offshore export cable corridor. These datasets have been agreed with relevant stakeholders in line with appropriate guidance.

5.11.1.5 From the baseline data, there is a low to moderate volume of vessel traffic located within and in proximity to the OAA. A total of 19 main commercial routes were identified, although

only five of these feature an average of more than one vessel per week. Commercial fishing vessels are prominent, with an average of ten unique fishing vessels per day recorded within 10nm (18.5km) of the OAA over a 28-day survey period. Recreational vessels were much less frequent, with an average of one unique recreational vessel every three days within 10nm (18.5km) of the OAA over a 28-day period, and all recorded during the Summer survey period.

5.11.1.6 There is a moderate volume of vessel traffic located within and in proximity to the RCP search area. A total of 31 main commercial routes were identified, with the busiest consisting of an average of 12 vessels per week. Commercial fishing vessels were again prominent, with an average of 14 unique fishing vessels per day recorded within 10nm (18.5km) of the RCP over a 12-month period. Recreational vessels featured more readily, but with notable seasonality – an average of one unique recreational vessel every day between May and August.

5.11.1.7 There is a high volume of vessel traffic crossing the offshore export cable corridor, although this is heavily weighted towards the Scottish east coast including coastal routeing by commercial vessels, commercial fishing vessel transits out of Peterhead and recreational vessels routeing nearshore in the Summer.

5.11.1.8 Organisations consulted during the EIA process have included the Maritime and Coastguard Agency, Northern Lighthouse Board, UK Chamber of Shipping, Royal Yachting Association Scotland, Peterhead Port Authority, Fraserburgh Harbour Commissioners, Scottish Fishermen's Federation, Serco NorthLink Ferries, Tidewater, Fletcher Group, Gardline (Boskalis), Sentinel Marine, and TorCargo.

5.11.2 Embedded environmental measures

5.11.2.1 A range of environmental measures within **Volume 3, Appendix 5.2** that relate to Shipping and Navigation are embedded as part of the Project design to remove or reduce significant environmental effects as far as possible.

5.11.2.2 Examples of these include promulgation of information, application for Safety Zones, marine coordination, and compliance with relevant regulator guidance.

5.11.3 Likely significant effects

Overview

5.11.3.1 No significant effects have been identified in relation to potential effects of the Project on Shipping and Navigation from the construction, O&M, and decommissioning of the Project. This also remains the case when considering inter-related effects, transboundary effects, and cumulative effects.

Inter-related effects

5.11.3.2 No project-lifetime inter-related effects were identified for shipping and navigation; familiarity with the Project will increase for third-party vessels as the stages progress, potentially reducing the likelihood of impacts arising.

Transboundary effects

5.11.3.3 Transboundary effects relating to vessels transiting to / from ports outside the UK, including transboundary ports, have been included in the assessment of effects.

Cumulative effects

5.11.3.4 No significant effects have been identified in relation to cumulative potential effects of the Project on shipping and navigation cumulatively with other developments across construction, O&M, and decommissioning of the Project.

5.12 Marine archaeology and cultural heritage

5.12.1 Overview

5.12.1.1 **Volume 1, Chapter 16: Marine Archaeology and Cultural Heritage** of the EIA Report examines the likely significant effects on marine archaeology and cultural heritage that may be experienced as a result of direct physical impact from construction activities and scour due to the construction, O&M, and decommissioning of the Project.

5.12.1.2 The assessment has considered the likely significant effects of the Project from the construction activities and O&M activities within the Offshore Red Line Boundary.

5.12.1.3 The marine archaeology and cultural heritage assessment considers the effects on known and suspected marine cultural heritage receptors (including anomalies identified as part of the geophysical survey, non-designated assets identified in the National Record of the Historic Environment, and wrecks identified by the United Kingdom Hydrographic Office).

5.12.1.4 The marine environment and the coastline have been utilised by humans from the Late Palaeolithic though the evidence for extensive use of the marine environment is limited to the post-medieval and modern periods. This may be the result of survivor bias, later wrecked material is more common as it has not deteriorated as a result of environmental factors. The Site was part of a busy sea lane connecting the British Islands with cities along the North, Norwegian and Barents Seas. This route was particularly key during the wars in the 20th century, when the majority of the shipwrecks found in the OAA and the export cable corridor were wrecked as a result of enemy activity.

5.12.1.5 Desk-based research and archaeological assessment of geotechnical and geophysical survey data have been undertaken, and an assessment has been carried out using criteria from industry standards and guidance.

5.12.1.6 The following organisations have been consulted: Aberdeenshire Council, MD-LOT and Historic Environment Scotland.

5.12.2 Embedded environmental measures

5.12.2.1 The assessment has taken account of embedded environmental measures including:

- Archaeological Exclusion Zones and Temporary Exclusion Zones will be utilised to ensure high and medium potential archaeological receptors are avoided.
- An approved Written Scheme of Investigation and Protocol for Archaeological Discoveries will be in place during the project to minimise the risk to marine archaeological receptors and ensure that an appropriate and informed mitigation strategy is developed and implemented.
- Receptors of lesser importance will be avoided where practical through micrositing.

5.12.3 Likely significant effects

Overview

5.12.3.1 Potential significant effects have been identified in relation to potential effects of the Project on currently unknown potential archaeological remains from construction, O&M of the Project.

Inter-related effects

5.12.3.2 No significant inter-related effects of greater significance compared to the effects considered alone were identified for marine archaeology and cultural heritage receptors from the construction and O&M of the Project.

Transboundary effects

5.12.3.3 No significant transboundary effects have been identified at this stage in relation to the Project on marine archaeology and cultural heritage receptors from construction and O&M activities.

Cumulative effects

5.12.3.4 No significant cumulative effects have been identified in relation to potential effects of the Project on marine archaeology and cultural heritage from construction and O&M of the Project.

5.13 Seascape, landscape and visual

5.13.1.1 **Volume 1, Chapter 17: Seascape, landscape and visual** of the EIA Report reviews and updates the Scoping Report information that led to the decision to scope the Seascape, Landscape and Visual Impact Assessment out of further assessment.

5.13.1.2 The review has considered additional information resulting from the development and maturity of the Project since the date of the Scoping Report. It has concluded that there is no basis for any significant residual effects on seascape, landscape and visual receptors resulting from the construction, O&M and decommissioning of the offshore Project infrastructure.

5.14 Infrastructure and other marine users

5.14.1 Overview

5.14.1.1 **Volume 1, Chapter 18: Infrastructure and Other Marine Users** of the EIA Report assesses the potential environmental effects from the Project on infrastructure and other marine user receptors from all stages of the Project (construction, O&M, and decommissioning for activities taking place seaward of MHWS). These include effects upon a number of different developments and projects in the area.

5.14.1.2 The assessment of infrastructure and other marine users has been carried out in accordance with all appropriate legislation, policy and guidance. The assessment considers the impacts on infrastructure and other marine user receptors and any resulting environmental effects within the infrastructure and other marine users study area (10nm).

The Project is within the vicinity of offshore wind farms, subsea cables (including offshore wind farm export cables and telecommunication cables) and licensed disposal sites.

5.14.1.3 The infrastructure and other marine users chapter assesses the potential environmental effects from the Project on other infrastructure and other marine user receptors. These impacts include:

- temporary obstruction to offshore wind farms;
- temporary obstruction to subsea cables and utilities;
- temporary obstruction of licensed disposal sites; and
- disturbance of UXO within identified areas or discovery of unexpected UXO.

5.14.1.4 Marine and coastal recreational activities and water sports have not been considered within **Volume 1, Chapter 18: Infrastructure and Other Marine Users** and are instead covered within **Volume 1, Chapter 15: Shipping and Navigation** and **Volume 1, Chapter 30: Socio-Economics**.

5.14.2 Embedded environmental measures

5.14.2.1 The assessment has taken account of embedded environmental measures including:

- The development of a number of plans, including a Cable Plan; Construction Method Statement; Lighting and Marking Plan, Navigational Safety and Vessel Management Plan and Emergency Response Plans.
- Advance warning and accurate location details of construction, O&M and decommissioning activities, including safety zones, and advisory passing distances will be given via Notice to Mariners and Kingfisher Bulletins.
- Any objects dropped on the seabed during works associated with the Project will be reported and objects will be recovered where they pose a hazard to other marine users and where recovery is possible.
- Crossing and proximity agreements with known existing pipeline and cable operators will be sought.

5.14.2.2 Consultation has been advanced with relevant stakeholders to detail additional appropriate measures to safeguard other developments and projects.

5.14.3 Likely significant effects

Overview

5.14.3.1 No significant effects were identified for the infrastructure and other marine users receptors from the Project. As a result, no additional measures have been proposed above and beyond the embedded environmental measures outline in **Volume 1, Chapter 18: Infrastructure and Other Marine Users**. Overall, no significant residual effects to any of the identified receptors are identified.

Inter-related effects

5.14.3.2 No significant inter-related effects of greater significance compared to the effects considered alone were identified for infrastructure and other marine user receptors from the construction, O&M and decommissioning of the Project.

Transboundary effects

5.14.3.3 No significant transboundary effects have been identified at this stage in relation to the Project on infrastructure and other marine user receptors from construction, O&M, and decommissioning activities.

Cumulative effects

5.14.3.4 No significant cumulative effects have been identified in relation to potential effects of the Project on infrastructure and other marine user from construction, O&M, and decommissioning of the Project.

6. Onshore Environmental Assessment

6.1 Introduction

6.1.1.1 This Section provides a summary of the assessment of likely significant effects to onshore resources and receptors including:

- ground conditions and contamination;
- water resources and flood risk;
- air quality;
- land use;
- terrestrial ecology and ornithology;
- onshore archaeology and cultural heritage;
- onshore noise and vibration;
- traffic and transport; and
- landscape and visual.

6.2 Ground conditions and contamination

6.2.1 Overview

6.2.1.1 This section summarises the assessment findings for ground conditions and contamination, based on **Volume 1, Chapter 19: Ground Conditions and Contamination** of the EIA Report.

6.2.1.2 **Volume 1, Chapter 19: Ground Conditions and Contamination** of the EIA Report presents the results of the assessment of the likely significant effects on ground conditions and land contamination that may arise from the construction, O&M and decommissioning of the Project landward of MLWS.

6.2.1.3 The ground conditions and land contamination assessment considers the potential significant effects on the following receptor categories: geology (including geodiversity), minerals, soils, carbon-rich soils and peatland, agricultural land (capability), and land contamination. Potential land contamination receptors include human health, the water environment (including groundwater, freshwater and coastal waters), property (including agricultural crops and livestock, buildings, infrastructure and buried utilities), and ecological receptors (including sites designated for nature conservation).

6.2.1.4 The ground conditions and land contamination Chapter has been informed by walkover surveys completed for **Volume 1, Chapter 22: Land Use** and **Volume 1, Chapter 19: Ground Conditions and Contamination**.

6.2.1.5 Consultation has been undertaken with Aberdeenshire Council, NatureScot, and the SEPA in relation to ground conditions and land contamination use effects.

6.2.2 Embedded environmental measures

6.2.2.1 A range of environmental measures within the **Volume 3, Appendix 5.2** which relate to land use are embedded as part of the Project design to remove or reduce significant environmental effects as far as possible.

6.2.2.2 Examples of these embedded environmental measures include the following:

- Soil handling in accordance with the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Department for Environment, Food and Rural Affairs (Defra), 2009) M-015 and M-071).
- Protection of soft or wet ground from compaction by construction traffic or plant (M-016), and management of excavated soils in accordance with an Outline Soil Management Plan (SMP) and guidance on Promoting the Sustainable Reuse of Greenfield Soils in Construction (SEPA, Civil Engineering Contractors Association and Environmental Industries Commission, 2010), and Waste Management (M-070).
- The footprints of permanent infrastructure including the onshore substations, landfall(s) transition joint bay(s) and onshore export cable corridor joint bay(s) will be minimised to that required for the safe O&M of the equipment in order to minimise land take (M-083).
- Commitment to protect and maintain / reinstate existing land drainage systems and to install suitable temporary drainage measures as needed (M-023).
- Commitment to ensuring that the land used for the development is suitable for the proposed use with respect to the potential for soil and groundwater contamination and, where necessary, risk-based remediation is undertaken in line with Environment Agency, Northern Ireland Environment Agency, SEPA, Natural Resources Wales, Society of Brownfield Risk Assessment (2020) statutory guidance Land Contamination: Risk Management and other guidance (including British Standard BS 10175: Investigation of Potentially Contaminated Sites (British Standards Institution, 2017) (M-073).
- The findings of the Preliminary Risk Assessment desk study (**Volume 3, Appendix 19.1: Phase 1 Contaminated Land Report**) will inform an intrusive ground investigation to be undertaken during pre-construction for the Project, to ensure that the land is suitable for the intended future use (M-067).
- An unexpected contamination protocol is to be produced during pre-construction, in line with UK statutory guidance (Land Contamination: Risk Management), to minimise the potential risks to human health and the water environment from any unexpected ground contamination (M-017 and M-018).
- **Volume 4: Outline Construction Environmental Management Plan** includes an Outline SMP (M-070) which includes a requirement to ensure that any excavated material suspected to be contaminated can be segregated until suitable testing, and risk assessment, has been completed to confirm its suitability for reuse or suitable disposal options.

6.2.3 Likely significant effects

Overview

6.2.3.1 No significant effects have been identified in relation to potential effects of the Project on ground conditions and land contamination receptors from construction, O&M and decommissioning of the Project.

Inte-related effects

6.2.3.2 No significant inter-related effects of greater significance compared to the effects considered alone were identified for ground conditions and land contamination receptors from the construction, O&M and decommissioning of the Project. A description and assessment of the likely inter-related effects arising from the Project on ground conditions and contamination is provided in **Chapter 32: Inter-Related Effects.**

Transboundary effects

6.2.3.3 No significant transboundary effects have been identified at this stage in relation to the Project on ground conditions and land contamination receptors from construction, O&M, and decommissioning activities.

Cumulative effects

6.2.3.4 No significant cumulative effects have been identified in relation to potential effects of the Project on ground conditions and land contamination receptors from construction, O&M, and decommissioning of the Project. A description and assessment of the cumulative effects arising from the Project on ground conditions and contamination is provided in **Chapter 33: Cumulative Effects Assessment**.

6.3 Water resources and flood risk

6.3.1 Overview

6.3.1.1 **Volume 1, Chapter 20: Water Resources and Flood Risk** of the EIA Report examines the likely significant effects in relation to water resources and flood risk during the construction, O&M and decommissioning of the Project.

6.3.1.2 The following organisations have been consulted: Aberdeenshire Council and SEPA.

6.3.1.3 The Project comprises landfall(s), onshore export cable corridor and onshore substations and intersects parts of the Buchan Coastal and River Ugie catchments and their associated tributaries. A range of receptors have been identified including Water Framework Directive water bodies, wetlands, Groundwater Dependent Terrestrial Ecosystems (GWDTEs), water resources and flood risk receptors.

6.3.1.4 A desk study and site walkovers have been undertaken to establish a baseline which identifies and describes these receptors. **Volume 1, Chapter 20: Water Resources and Flood Risk** summarises key findings and draws upon detailed information which is presented in the supporting Appendices: **Volume 3, Appendix 20.1: Detailed Hydrological and Hydrogeological Baseline Report** and **Volume 3, Appendix 20.2: Flood Risk Assessment**.

6.3.1.5 The cable route crosses several groundwater bodies and the River Ugie which support several Private Water Supplies (PWSs) and a public water supply respectively. A number of potential GWDTEs were also identified following on from National Vegetation Classification surveys. A screening assessment has been carried out for each of these potential receptors in accordance with recent SEPA guidance (SEPA, 2025) and presented within **Volume 3, Appendix 20.1**.

6.3.2 Embedded environmental measures

6.3.2.1 A range of environmental measures, within **Volume 3, Appendix 5.2** which relate to water resources and flood risk are embedded as part of the Project design to remove or reduce significant environmental effects as far as possible. The following summary focuses upon the key embedded environmental measures.

6.3.2.2 The onshore export cable corridor has been carefully routed to minimise interaction with the numerous PWSs, SEPA Controlled Activity Regulations abstractions and a public water supply along with other environmental and engineering constraints. A number of specific embedded environmental measures have also been put in place to ensure that such receptors are adequately considered and protected:

- In certain cases (PWSs 10 and 11: Lunderton Farmhouse and Westfield, PWS 26: West Thunderton and PWS 30: Parkhill) PWSs have been identified as within 250m of the onshore export cable corridor and consequently in potential hydrological connection with the Project. On this basis a commitment has been made for further detailed assessment and monitoring (subject to the outcomes of that assessment) post consent and prior to construction.
- In relation to PWS 30: Parkhill the proposed drilling works are likely to be directly below the well and therefore the Applicant has made a specific commitment to the provision of an alternative water supply (subject to the agreement from the PWS owner) at that location prior to any construction to avoid any potential impact. It is known from Scottish Water asset information that there is an existing mains network in the area which could potentially be connected into. This measure would help negate the need for further assessment and monitoring at Parkhill, as it would remove any pathway for contamination towards that supply.
- The Project crosses part of the River Ugie Drinking Water Protection Area (DWPA) and consequently several embedded environmental measures are proposed to mitigate any potential effects. These include the following:
  - precautions to protect DWPA and Scottish Water assets including appropriate standoff distances from construction works in accordance with Scottish Water good industry practice guidance;
  - careful siting of wastewater facilities;
  - trenchless crossings within the DWPA; and
  - monitoring of River Ugie and its tributaries.
- Each of these measures have been put forward to protect the public water supply, which is situated approximately 2.2km downstream of the trenchless crossing of the River Ugie by the onshore export cables.

6.3.3 Likely significant effects

Overview

6.3.3.1 On the basis of successful implementation of the embedded mitigation and design measures, no significant effects have been identified from the Project on water resources and flood risk receptors during construction, O&M and decommissioning of the Project.

Inter-related effects

6.3.3.2 No significant inter-related effects have been identified for water resources and flood risk receptors from the construction, O&M and decommissioning of the Project.

Transboundary effects

6.3.3.3 No significant transboundary effects have been identified at this stage in relation to the Project on water resources and flood risk receptors from construction, O&M and decommissioning activities.

Cumulative effects

6.3.3.4 No significant cumulative effects have been identified in relation to potential effects of the Project on water resources and flood risk receptors from construction, O&M, and decommissioning of the Project.

6.4 Air quality

6.4.1 Overview

6.4.1.1 **Volume 1, Chapter 21: Air Quality** of the EIA Report examines the likely significant effects on air quality that may be caused due to emissions of dust, and any significant increases of pollutants in the air.

6.4.1.2 The main pollutants of concern in the UK in relation to health effects are nitrogen dioxide and particulate matter (PM): specifically, PM of less than ten micrometres in diameter, and PM of less than five micrometres in diameter.

6.4.1.3 The change in activity due to the Project could give rise to increased emissions; specifically, emissions of dust during construction works and emissions of air pollutants from changes in road vehicle movements in the construction stage.

6.4.1.4 The assessment has considered the potential effects of construction dust on people within 250m of the Onshore Red Line Boundary and construction site entrance(s), and within 50m of the routes(s) used by vehicles on the public highway. For ecological sites the distance is considered within 50m from Onshore Red Line Boundary, construction sites and routes used by construction vehicles on public highways up to 250m of the construction site entrance(s).

6.4.1.5 The assessment has also considered the potential effects of emissions to air from construction traffic and construction plant equipment on ecological receptors and sensitive human receptors within 200m of affected roads and temporary construction sites. Additional traffic associated with the O&M and decommissioning stages was scoped out as the amount of traffic for servicing this Project will be very low and are unlikely to exceed the criteria set

out in the Institute of Air Quality Management (IAQM) guidance and detailed in **Volume 1, Chapter 21: Air Quality**.

6.4.1.6 Consultation has been undertaken with Aberdeenshire Council in relation to air quality effects where the study area of the assessment was discussed and approved.

6.4.2 Embedded environmental measures

6.4.2.1 Environmental measures which relate to air quality are embedded as part of the Project design to remove or reduce significant environmental effects as far as possible and are presented within **Volume 3, Appendix 5.2**.

6.4.2.2 Key embedded environmental measures include the following:

- Where practical, sensitive sites will be avoided by the temporary and permanent onshore project footprint including SPAs, Special Areas of Conservation, SSSIs, National Nature Reserve, Local Nature Reserves, Local Wildlife Sites, Local Nature Conservation Site (LNCS), Ancient Woodland (AW), areas of consented development, areas of historic landfill and other known areas of potential contamination, Scottish National Trust land, Listed Buildings and Scheduled Monuments.
- Best practice air quality management measures will be applied as described in the IAQM (2024) guidance on the Assessment of Dust from Demolition and Construction to avoid adverse effects on sensitive features. Examples of pathways include windblown dust / fibres or tracking back of dust / fibres is a potential contamination migration.
- The onshore export cable will be constructed in sections. The trenches will be excavated, the cable ducts will be laid, the trenches backfilled, and the reinstatement process commenced in as short a timeframe as practical.
- A **Construction Environmental Management Plan** (CEMP) to be implemented by the contractor. The contactor will ensure that the relevant environmental measures within the CEMP and health and safety procedures are implemented. A CEMP will identify the project management structure roles and responsibilities for managing and reporting on the environmental impact of the construction stage.

6.4.3 Likely significant effects

Overview

6.4.3.1 No significant effects have been identified in relation to potential effects on air quality from the construction, O&M or decommissioning of the Project.

Inter-related effects

6.4.3.2 Overall, some inter-related effects on residents and ecological receptors may arise on a temporary basis.

6.4.3.3 No significant inter-related effects of greater significance compared to the effects considered alone were identified for air quality receptors from the construction of the Project. The O&M stage was not considered for inter-related effects.

Transboundary effects

6.4.3.4 No significant transboundary effects have been identified at this stage in relation to the Project on air quality receptors from construction activities. The O&M stage was not considered for transboundary effects.

Cumulative effects

6.4.3.5 No significant cumulative effects have been identified in relation to potential effects of on air quality from construction of the Project. The O&M stage was not considered for cumulative effects.

6.5 Land use

6.5.1 Overview

6.5.1.1 **Volume 1, Chapter 22: Land Use** of the EIA Report presents the results of the assessment of the likely significant effects on land use that may arise from the construction, O&M and decommissioning of the Project landward of MLWS.

6.5.1.2 The land use assessment considers the potentially significant effects on the following receptor categories: agriculture, fields and boundaries; water; forestry, woodland and trees; other land uses; and settlements. These are in accordance with NatureScot guidance for EIA.

6.5.1.3 Following refinement of the design, the main land use in the Onshore Red Line Boundary and land use study area is agriculture. A range of agricultural activities are undertaken including grazing of sheep and cows, and arable farming of a range of crops. No 'prime agricultural land' (the most versatile agricultural land for growing crops), and no Wild Land Areas as defined in NPF4, are present in the study area. Water receptors, forestry and woodland, other land uses (including an LNCS and part of a golf course) and some isolated dwellings are present, however direct land use impacts on these are avoided through sensitive routing of the onshore export cable corridor and the implementation of use of trenchless crossings to route cables below the features without disturbance to the land at surface.

6.5.1.4 The land use Chapter has been informed by walkover surveys completed for **Volume 1, Chapter 22: Land Use** and **Volume 1, Chapter 19: Ground Conditions and Contamination** assessments, in addition to ecological habitat surveys and surveys completed for the landscape and visual assessment.

6.5.1.5 Consultation has been undertaken with Aberdeenshire Council, NatureScot and SEPA in relation to land use effects.

6.5.2 Embedded environmental measures

6.5.2.1 A range of environmental measures within the **Volume 3, Appendix 5.2** which relate to land use are embedded as part of the Project design to remove or reduce significant environmental effects as far as possible.

6.5.2.2 Examples of these embedded environmental measures include the following:

- The onshore export cable corridor avoids settlements, open space and land used by the community that might be directly affected or severed.

- The buried nature of the onshore export cables minimises the need for permanent land take and permanent above ground structures.
- The Project avoids causing fragmentation of woodland, semi-natural land or sensitive habitats through sensitive routing of the onshore export cable corridor and the use of Horizontal Directional Drilling (HDD) (or alternative trenchless crossing methods) to avoid disturbance of / change to land cover. In relation to trenchless crossings, HDD has been presented in the EIA. Whilst other trenchless methods are available, HDD is presented herein as it is likely to have the largest construction footprint.
- The Project avoids permanent development on prime agricultural land (Class 1, 2 or 3 Land Capability for Agricultural grades) with the aim of preserving the best quality agricultural land for its future food / biomass production capability.
- The **Volume 4: Outline Construction Environmental Management Plan** includes an Outline Soil Management Plan (Outline SMP), the purpose of which is to protect soils and enable land that is temporarily disturbed during construction, to be restored back to the baseline agricultural use.
- The footprints of permanent infrastructure including the onshore substations, the landfall(s) transition joint bays and onshore export cable corridor joint bays will be minimised to that required for the safe O&M of the equipment in order to minimise land take.

6.5.3 Likely significant effects

Overview

6.5.3.1 No significant effects have been identified in relation to potential effects of the Project on land use receptors from construction, O&M and decommissioning of the Project.

Inter-related effects

6.5.3.2 No significant inter-related effects of greater significance compared to the effects considered alone were identified for land use receptors from the construction, O&M and decommissioning of the Project.

Transboundary effects

6.5.3.3 No significant transboundary effects have been identified at this stage in relation to the Project on land use receptors from construction, O&M, and decommissioning activities.

Cumulative effects

6.5.3.4 No significant cumulative effects have been identified in relation to potential effects of the Project on land use from construction, O&M, and decommissioning of the Project.

6.6 Terrestrial ecology and ornithology

6.6.1 Overview

6.6.1.1 **Volume 1, Chapter 23: Terrestrial Ecology and Ornithology** of the EIA Report examines the likely significant effects that may be experienced by terrestrial ecology and ornithology features due to the construction, O&M, and decommissioning of the Project.

6.6.1.2 The assessment has considered the likely significant effects as a result of the Project from the following sources: construction of the onshore elements (landfall(s), onshore export cable corridor, onshore substation(s); and associated construction traffic), O&M stage and during the decommissioning stage (the removal of equipment and reinstating sites; including associated traffic).

6.6.1.3 A data gathering exercise comprising an ecological desk study and a suite of baseline ecology and ornithology surveys, including protected species, habitats and vegetation and wintering and breeding birds, were undertaken between 2022 to 2024. A comprehensive scoping rationale is provided for each identified feature to evaluate the necessity for further assessment. Justifications for including or excluding each ecological feature are based on an analysis of its status both in relation to the Project and within the designated ZOI.

6.6.1.4 The terrestrial ecology and ornithology assessment considers effects on the following features identified as 'Important Ecological Features': Loch of Strathbeg SPA / Ramsar (Non-breeding pink-footed goose and whooper swan), Rattray Head to Peterhead LNCS (sand dune communities and winter bird assemblage), AW, otter, badger and freshwater fish.

6.6.1.5 All three potential landfall(s) overlap the Rattray Head to Peterhead LNCS, which supports Habitats Directive listed Annex I habitats comprising sand dune communities, which could be subject to damage or modification during the construction stage. Pink-footed geese were recorded throughout the winter in high numbers (peak counts of >1% of the SPA population) utilising agricultural land to the south of St Fergus Gas Terminal and surrounding fields (considered to be functionally linked with the Loch of Strathbeg SPA / Ramsar) within a ZOI of the Onshore Red Line Boundary at Scotstown landfall. Whooper swans were also recorded at this location, but only on two occasions during two years of winter surveys, but on one occasion a peak count of ~12% of the SPA population was recorded) in the same location. The Rattray Head to Peterhead LNCS and adjacent agricultural fields are also important for foraging geese, waders and wildfowl. There are potential impact pathways in terms of disturbance effects to pink-footed geese and whooper swan resulting in temporary displacement / loss of these areas during the construction stage.

6.6.1.6 The River Ugie is known to support Atlantic salmon and sea trout within the Onshore Red Line Boundary and has required careful consideration in terms of design and construction methodologies. AW is present within the Onshore Red Line Boundary along the River Ugie, with this being avoided in the Project design.

6.6.1.7 The Project is within the home range of otters and therefore construction activity may result in disturbance to the local otter population and there may be impacts to their prey species – either from the placement of infrastructure or due to noise disturbance.

6.6.1.8 Potential bat roost, commuting and foraging habitat has been avoided or minimised through careful siting of infrastructure and where avoidance cannot be fully achieved, appropriate measures adopted.

6.6.1.9 Badgers were also recorded within the Onshore Red Line Boundary. This species is highly mobile and habitat suitable for badger sett creation, which could be subject to damage or

disturbance resulting from construction stage impacts, is present within the Onshore Red Line Boundary.

6.6.1.10 The following organisations were consulted: Aberdeenshire Council, NatureScot, RSPB and Ugie District Salmon Fisheries Board.

6.6.2 Embedded environmental measures

6.6.2.1 A range of environmental measures within the **Volume 3, Appendix 5.2**, which relate to terrestrial ecology and ornithology are embedded as part of the Project design to remove or reduce significant environmental effects as far as practicable.

6.6.2.2 Examples of these embedded environmental measures include:

- A trenchless solution is to be implemented to install ducts to reduce the environmental impact of the landfall(s).
- Pre-construction ecology surveys will be undertaken to inform the specification of relevant impact avoidance and mitigation measures, such as relevant stand-off distances etc, in accordance with **Volume 4: Outline Construction Environmental Management Plan** (CEMP) and latest available species-specific guidance.
- An Ecological Clerk of Works (ECOW) will ensure that construction works areas can be appropriately microsited where appropriate to avoid or minimise habitat loss, in accordance with the Outline CEMP.
- An onshore Species Protection Plan (SPP) outlining how the Project will address potential impacts on protected species will be produced, in accordance with the Outline CEMP and latest available species-specific guidance. This will include a Bird Protection Plan to safeguard breeding and roosting bird species. The SPP will be updated with data from the pre-construction surveys by the ECOW or Project Ecologist to inform the construction stage process.
- Commitment to avoid works during sensitive winter periods (October to March) in areas identified as supporting pink-footed geese within a ZOI of the Scotstown landfall. Where spatial avoidance cannot be achieved, temporal avoidance will be achieved through development of a phasing strategy, to best target working periods for these more sensitive areas.

6.6.3 Likely significant effects

Overview

6.6.3.1 No significant effects have been identified in relation to terrestrial ecology and ornithology features as a result of the construction, O&M and decommissioning of the Project.

Inter-related effects

6.6.3.2 No significant inter-related effects have been identified for terrestrial ecology and ornithology features as a result of the construction, O&M and decommissioning of the Project.

Transboundary effects

6.6.3.3 No significant transboundary effects have been identified in relation to terrestrial ecology and ornithology features as a result of the construction, O&M, and decommissioning of the Project.

Cumulative effects

6.6.3.4 No significant cumulative effects have been identified in relation to terrestrial ecology and ornithology features as a result of the construction, O&M, and decommissioning of the Project.

6.7 Onshore archaeology and cultural heritage

6.7.1 Overview

6.7.1.1 **Volume 1, Chapter 24: Onshore Archaeology and Cultural Heritage** of the EIA Report examines the likely significant effects on onshore archaeology and cultural heritage arising from the construction, operation, maintenance, and decommissioning of the Project. The assessment considers the potential archaeological and cultural heritage impacts associated with the construction of the onshore elements (landfall(s), onshore export cable corridor, onshore substations, and extension to the existing substation), as well as the operation of the onshore substations. Using criteria defined by industry standards and guidance, the onshore archaeology and cultural heritage assessment evaluates effects on designated heritage assets (Scheduled Monuments and listed buildings) and non-designated heritage assets (archaeological remains, artefacts, and historic structures).

6.7.1.2 The Onshore Red Line Boundary predominantly features open, gently rolling farmland, punctuated by stands of trees surrounding residential buildings and a mix of vegetation along field boundaries. Traversing key landmarks such as the A950, the River Ugie, and the A90, this largely undisturbed landscape offers favourable conditions for the preservation of potential archaeological remains and artefacts. In close proximity to the Project, several listed buildings, primarily historic farmsteads, reflect the area's rich heritage. Nearby Scheduled Monuments encompass medieval and post-medieval castles and churches, while the coastline is marked by World War II defence installations, including pillboxes and anti-tank blocks, which further contribute to the historical character of the region.

6.7.1.3 The following organisations have been consulted during the assessment process: Aberdeenshire Council, MD-LOT, and Historic Environment Scotland.

6.7.2 Embedded environmental measures

6.7.2.1 A range of environmental measures within the Commitments Register (**Volume 3, Appendix 5.2**) which relate to onshore archaeology and cultural heritage are embedded as part of the Project design to remove or reduce significant environmental effects as far as possible.

6.7.2.2 Examples of these embedded environmental measures include the following:

- A CEMP to ensure that archaeological mitigation measures are embedded in the construction stage of the Project.

- Any significant effects on the settings of heritage assets remaining after design iterations will be mitigated as far as reasonably practical through sensitive design treatment of visible elements of the Project.
- Avoidance of buried historic structures.

6.7.3 Likely significant effects

Overview

6.7.3.1 No significant effects have been identified in relation to potential effects of the Project on onshore archaeology and cultural heritage from construction, O&M and decommissioning of the Project.

Inter-related effects

6.7.3.2 No significant inter-related effects of greater significance compared to the effects considered alone were identified for onshore archaeology and cultural heritage receptors from the construction, O&M and decommissioning of the Project.

Transboundary effects

6.7.3.3 No significant transboundary effects have been identified at this stage in relation to the Project on onshore archaeology and cultural heritage from construction, O&M, and decommissioning activities.

Cumulative effects

6.7.3.4 No significant cumulative effects have been identified in relation to potential effects of the Project on onshore archaeology and cultural heritage from construction, O&M, and decommissioning of the Project.

6.8 Onshore noise and vibration

6.8.1 Overview

6.8.1.1 **Volume 1, Chapter 25: Onshore Noise and Vibration** of the EIA Report examines the likely significant effects that may be experienced as a result of noise and vibration due to the construction, O&M and decommissioning of the Project.

6.8.1.2 The assessment has considered the likely significant noise and vibration effects of the Project from the following sources: construction of the onshore elements of the Project (landfall(s), onshore export cable corridor, onshore substations) and associated construction traffic and the removal of equipment and reinstating sites during the decommissioning stage. The assessment also considers the O&M of the onshore substations.

6.8.1.3 The noise and vibration assessment considers the effects on residential receptors (people in their homes including their gardens).

6.8.1.4 The coastline is interspersed with villages, largely within an area that is predominately agricultural land, with the A90 running north / south. Sound levels in the area are likely to be influenced by road and additional sources of human activity, as well as the sea on

approaching the coast. The largest settlement in the study area is St Fergus. Sound levels here are principally likely to be influenced by local road traffic, as well as other sources of human activity. Inland from the coast, the study area is predominantly rural with the onshore substation site located to the south of the A950, beyond which lies the Longside Airfield. There are various isolated dwellings and some small villages throughout.

6.8.1.5 Baseline vibration levels are likely to vary widely with localised temporary events, such as construction works. Otherwise, vibration levels are likely to be **Negligible** for most of the study area.

6.8.1.6 Baseline noise surveys have been undertaken, and an assessment has been carried out using criteria from industry standards and guidance.

6.8.2 Embedded environmental measures

6.8.2.1 A range of environmental measures within the Commitments Register (is provided in the **Volume 3, Appendix 5.2**) which relate to noise and vibration are embedded as part of the Project design to remove or reduce significant environmental effects as far as possible. Examples of these embedded environmental measures include the following:

- implementation of noise mitigation and best practice techniques secured via the Outline CEMP (see **Volume 4: Outline Construction Environmental Management Plan**);
- implementation of a Noise and Vibration Management Plan (NVMP) as identified in the **Volume 4: Outline Construction Environmental Management Plan**;
- road condition surveys will be carried out where construction access routes are located within ten metres of a residential building to minimise the risk from vibration effects; and
- implementation of a design limit for the operational noise from the onshore substations to meet the requirements of Aberdeenshire Council.

6.8.3 Likely significant effects

Overview

6.8.3.1 The assessment considers the impact on residential receptors during the construction, O&M and decommissioning stages of the Project.

6.8.3.2 With the embedded environmental measures in place, no significant effects have been identified in relation to potential construction and decommissioning stage effects associated with the Project. After detailed design and before the commencement of the construction stage, a NVMP will be produced and agreed with Aberdeenshire Council setting out the requirements for noise and vibration mitigation measures.

6.8.3.3 No significant effects were identified in relation to the potential effects associated with the changes in road traffic noise due to construction stage traffic.

6.8.3.4 With the embedded environmental measures in place, no significant effects have been identified in relation to potential O&M stage effects associated with the operation of the onshore substations.

Inter-related effects

6.8.3.5 No significant inter-related effects of greater significance compared to the effects considered alone were identified for noise and vibration receptors from the construction, O&M and decommissioning of the Project.

Transboundary effects

6.8.3.6 No significant transboundary effects have been identified at this stage in relation to the Project on noise and vibration receptors from construction, O&M and decommissioning activities.

Cumulative effects

6.8.3.7 No significant cumulative effects have been identified in relation to potential effects of the Project on noise and vibration from construction, O&M and decommissioning of the Project.

6.9 Traffic and transport

6.9.1 Overview

6.9.1.1 **Volume 1, Chapter 26: Traffic and Transport** of the EIA Report examines the likely significant effects that may be experienced as a result of traffic and transport due to the construction, O&M, and decommissioning of the Project.

6.9.1.2 The assessment has considered the likely significant transport-related effects of the Project from the following sources: construction of the onshore elements of the Project (landfall(s), onshore export cable corridor, onshore substations) and associated construction traffic. The assessment does not consider the construction of offshore elements of the Project, or operation of the onshore substations and WTGs.

6.9.1.3 The traffic and transport assessment considers the effects on residential receptors (people in their homes including their gardens); and non-residential receptors (including schools, hospitals, places of worship, commercial buildings, and leisure areas).

6.9.1.4 The largest settlement in the study network is Peterhead which lies along the coast to the east. Inland from the coast, the study network is predominantly rural, comprising a mosaic of arable and livestock farming land with blocks of commercial forestry. There are various isolated dwellings and some small villages throughout.

6.9.1.5 Baseline traffic surveys have been undertaken and complemented with national datasets, and an assessment has been carried out using criteria from industry standards and guidance.

6.9.1.6 The following organisations have been consulted: Aberdeenshire Council, MD-LOT and Transport Scotland.

6.9.2 Embedded environmental measures

6.9.2.1 A range of environmental measures within the **Volume 3, Appendix 5.2** which relate to traffic and transport are embedded as part of the Project design to remove or reduce significant environmental effects as far as possible.

6.9.2.2 Examples of these embedded environmental measures include the following:

- Road condition surveys will be carried out pre and post construction to assess the impact of construction traffic on structural integrity of the road assets.
- Implementation of traffic management measures such as temporary signage and speed limits secured via the **Volume 4: Outline Construction Traffic Management Plan**.
- Road Construction Consent or Section 56 of the Roads (Scotland) Act 1984 (Scottish Government, 1984), for construction of public road improvements to support construction activities.

6.9.3 Likely significant effects

Overview

6.9.3.1 No significant effects have been identified in relation to potential effects from traffic and transport during the construction, O&M and decommissioning of the Project.

Inter-related effects

6.9.3.2 No significant inter-related effects of greater significance compared to the effects considered alone were identified for traffic and transport receptors from the construction of the Project.

Transboundary effects

6.9.3.3 It has been identified that there is no need for an assessment of transboundary impacts as the ports shortlisted within **Volume 1, Chapter 4: Project Description** are all located in Scotland.

Cumulative effects

6.9.3.4 No significant cumulative effects have been identified in relation to potential effects of the Project on traffic and transport from construction of the Project.

6.10 Landscape and visual

6.10.1 Overview

6.10.1.1 **Volume 1, Chapter 27: Landscape and Visual** of the EIA Report examines the likely significant landscape and visual effects that may be experienced as a result of the construction, O&M, and decommissioning of the onshore infrastructure for the Project.

6.10.1.2 The landscape and visual impact assessment (LVIA) and the design of the Project has taken account of relevant legislation, consultation and national and local planning policy in respect of the landscape. It has been undertaken to accord with the Landscape Institute and Institute of Environmental Management and Assessment (IEMA) (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, and other best practice guidance.

6.10.1.3 Aspects considered by the assessment include the likely effects of the onshore infrastructure on the landscape and visual resource. This encompasses the effects on landscape elements, characteristics, landscape character, and designated landscapes; and visual effects on views from settlements, transport and recreational routes, and recreational / visitor attractions as well as cumulative effects with other development.

6.10.1.4 Within the study area, the existing landscape character includes scenic coastlines with beaches and rocky headlands, dunes and coastal grassland, and an extensive area of gently undulating Coastal Agricultural Plain. Part of this landscape is locally designated North East Aberdeenshire Coast Special Landscape Area (SLA). The area also includes pockets of development at Longside Airfield and along the fringes of Peterhead and the A950. The main settlements in the area include Peterhead, St Fergus, and Longside and the main transport routes include the A90 (also the route of the North East 250 and The Coastal Trail tourist routes) and the A950. One of Scotland's Great Trails, 'The Formartine and Buchan Way' and a network of core paths and other local recreational routes are present within the area, as well as local tourist / visitor attractions associated with the coast (St Fergus Churchyard and Scotstown Beach) and recreational attractions at Peterhead and Longside Golf Courses.

6.10.2 Embedded environmental measures

6.10.2.1 A range of environmental measures within **Volume 3, Appendix 5.2** which relate to the landscape and visual resource are embedded as part of the Project design to remove or reduce significant environmental effects as far as possible. Examples of these embedded environmental measures include the following:

- Provision of an indicative landscape design plan within the onshore substation site ('onsite mitigation') where, subject to detailed design post-consent, planting would be installed to provide early screening and landscape and biodiversity enhancement as outlined in **Volume 4: Outline Landscape and Architectural Strategy**.
- Protection of the landscape resource – trees, woodland and hedgerows have been surveyed (**Volume 3, Appendix 23.10: Arboricultural Impact Assessment**) and will be retained where possible.
- On-going design process to avoid, minimise and mitigate the effects of the Project by, for example, minimising working widths, and use of underground cables and trenchless crossing techniques to avoid and minimise effects on particular landscapes and elements including trees, woodland and hedgerows.
- Provision of plans for landscape maintenance and management within **Volume 4: Outline Landscape and Architectural Strategy** to ensure landscape maintenance and management of the onshore substations and where required reinstatement of vegetation along the route of the offshore export cable corridor.

6.10.2.2 As **Volume 1, Chapter 27: Landscape and Visual** of the EIA Report and **Volume 4: Outline Landscape and Architectural Strategy** supports an application for PPiP rather than full planning permission, the detailed siting, design and implementation of these proposed embedded environmental measures would need to be addressed through post-consent conditions.

6.10.3 Likely significant effects

Overview

6.10.3.1 The significant effects resulting from construction of the onshore export cable and landfall(s) would affect a range of coastal and inland landscapes, and part of the North East Aberdeenshire Coast SLA. Visual effects would include the views from St Fergus, the A90 (overlapped by the North East 250, The Coastal Trail), minor roads (some overlapped by local cycle routes / footpaths), part of The Formartine and Buchan Way, Peterhead Golf

Course and Scotstown Beach. All of these effects are 'reversable' and would be mitigated and reduced to Not Significant levels of effect by the end of the construction stage.

6.10.3.2 The significant effects resulting from construction and O&M of the onshore substations would affect a more limited range of receptors within an undesignated landscape close to existing industrial and agricultural uses. On the basis that it would not be possible to screen the onshore substations, **Volume 4: Outline Landscape and Architectural Strategy** sets out a framework for how the Project would seek to reduce impact and enhance the landscape where possible. Detailed siting, design and mitigation measures would be presented in the detailed Landscape and Architectural Strategy prior to construction.

6.10.3.3 Additionally, and where possible, potential further mitigation could be undertaken to strengthen the existing pattern of trees, woodland and hedges in the area surrounding the onshore substations to provide increased screening and an enhanced landscape setting to better integrate the development within its landscape context.

6.10.3.4 Decommissioning of the onshore substations would be subject to a decommissioning plan and the decommissioning effects would be similar to those effects during construction, although gradually reduced as the onshore substations are removed. Depending on the decommissioning plan these works may be screened by mature woodland, trees and hedgerows established during the O&M stage.

Inter-related effects

6.10.3.5 The LVIA has considered the inter-related effects of different parts of the onshore infrastructure which may be visible simultaneously or sequentially and / or phases of the same development occurring over time. There are no significant inter-related effects involving other environmental disciplines in combination with landscape and visual effects on the same receptor (for example, noise, heritage, ecology, traffic).

Transboundary effects

6.10.3.6 There would be no transboundary landscape or visual effects.

Cumulative effects

6.10.3.7 The assessment has considered the cumulative effects of 'other developments' that may interact with the Project's zones of influence during their construction, O&M and decommissioning which may be visible simultaneously or sequentially. Of the nineteen other developments scoped into the landscape and visual cumulative effects assessment, six would have a significant cumulative landscape and / or visual effect with the onshore Project infrastructure (during construction and / or O&M) as follows:

- ON-001: SSEN Netherton Hub (during construction and O&M);
- ON-008: Inverugie Meadows residential mixed-use development (during construction only if construction periods overlap);
- ON-010: Salamander Offshore Wind Farm (during construction only);
- ON-012: Muir Mhòr Offshore Wind Farm (onshore infrastructure), (during construction and O&M);
- ON-017: Erection of three wind turbines (construction only); and
- ON-022: Installation of Underground cable, erection of substation building and siting of transformer units and associated works (construction only).

7. Whole-Project Environmental Assessment

7.1 Introduction

7.1.1.1 This Section provides a summary of the assessment of likely significant effects to whole Project resources and receptors including:

- climate resilience;
- greenhouse gases (GHG);
- socio-economics; and
- civil and military aviation.

7.2 Climate resilience

7.2.1 Overview

7.2.1.1 **Volume 1, Chapter 28: Climate Resilience** of the EIA Report examines the likely significant effects that the Project may experience as a result of climate change. This assessment is different to other EIA topics in that the assessment considers the impact of the environment (climate) on the Project, rather than the impact of the Project on the environment.

7.2.1.2 The climate resilience assessment gathers data on the current climatic conditions and uses future climate data (climate projections) to understand how the climate is likely to change. From this analysis and an understanding of the Project, the ways in which climate may impact the Project are identified. The climate resilience assessment considers the impacts to offshore and onshore infrastructure and human health across the construction, O&M and decommissioning stages of the Project.

7.2.1.3 Climate projection data used to inform the assessment uses 20 year time periods. To assess the construction stage (anticipated to commence in 2030), climate projection data for 2020to 2039 (2030s) has been used, with consideration of the climate trends extending into the 2040 to 2059 (2050s). The O&M stage has been assessed using climate data for the 2030s, 2050s and into 2060 to 2079 (2070s). The decommissioning stage has been assessed using climate projection data for the timeframe 2080 to 2099 (2090s).

7.2.1.4 Examples of climate-related impacts which may affect the Project include:

- increased heat stress or heat exhaustion experienced by personnel and unsafe working conditions from stormy conditions;
- disruption or delay caused by cranes/barges/rigs unable to operate in high winds and storms;
- destabilisation or damage to offshore and onshore infrastructure from severe and extreme weather events;
- sediment transport across the seabed impacting foundation and buried cables;
- overheating and failure of mechanical and electrical equipment and reduction in power transmission from high temperatures;

- flooding, overwhelmed drainage and water ingress from increased precipitation causing damage to infrastructure and impeding access;
- damage to onshore infrastructure from coastal flooding and erosion, wildfires, lightning strike, high winds; and
- interruption or temporary loss of key supply-chain / third party networks (such as telecommunication networks, grid connections).

7.2.1.5 The construction stage is anticipated to commence in 2030 and take place over 12 years for offshore infrastructure and up to nine years for onshore infrastructure. From a climatic perspective, this timeframe is reasonably short and the embedded environmental measures in place to manage the climate-related impacts are considered sufficient to ensure the likelihood and consequence of climate change related impacts are **Not Significant**.

7.2.1.6 The O&M stage and decommissioning stage are more susceptible to a changing climate. Measures to build resilience to climate change have been incorporated into the design, O&M and decommissioning stages for the Project. The likelihood and consequence of climate change related impacts during O&M stage and decommissioning stage are **Not Significant**.

7.2.2 Embedded environmental measures

7.2.2.1 A range of embedded environmental measures within the **Volume 3, Appendix 5.2** which relate to climate change are embedded as part of the Project design to remove or reduce significant effects as far as possible.

7.2.2.2 Examples of these embedded environmental measures include the following:

- Monitoring of weather forecasts and planning of construction, O&M and commissioning works to avoid severe weather events.
- Using well maintained and serviced equipment which will have greater ability to withstand adverse weather.
- Regular inspection and maintenance programme.
- Implementing Risk Assessment Method Statements to protect personnel.
- WTG design allows for 50 year return period values for short term gust, peak wind speed and wave conditions.
- Outline operational drainage strategy has designed the Sustainable Drainage Systems to accommodate 1:200 year (0.5 percent Annual Exceedance Probability) plus 37 percent climate change based on the SEPA guidance.
- Ground investigation studies to inform foundation design, and siting of critical infrastructure on level terrain.
- Electrical assets design for temperatures up to 40°C with surge protection installed, and secondary or emergency power supply will be provided (as necessary).
- Development and implementation of a **Volume 4: Outline Scour Protection Plan** and CBRA.
- Consideration of emergency access arrangements within an operations and maintenance strategy.

7.2.3 Likely significant effects

Overview

7.2.3.1 Taking into account the embedded environmental measures, no significant effects were identified during the construction stage, O&M stage and the decommissioning stage.

Inter-related effects

7.2.3.2 No inter-related effects have been identified as the receptor for the assessment of climate resilience is the Project, which is not shared by other topics.

Transboundary effects

7.2.3.3 No transboundary effects are anticipated on the basis that climate-related impacts and embedded environmental measures are specific to the development and will not result in impacts to an adjacent state.

Cumulative effects

7.2.3.4 No cumulative effects have been identified as the resilience of the Project assets, from a climate perspective, are unaffected by 'other developments'.

7.3 Greenhouse gases

7.3.1 Overview

7.3.1.1 **Volume 1, Chapter 29: Greenhouse Gases** of the EIA Report evaluates potential GHG emissions resulting from the construction, O&M, and decommissioning stages of the Project. It provides a comprehensive overview of how the Project may contribute to climate change and how those impacts are being managed.

7.3.1.2 The assessment covers both offshore and onshore infrastructure elements of the Project, including WTGs, onshore substations, onshore export cable corridor and landfall(s). The assessment also considers emissions from materials used, transport, construction activities, maintenance, and eventual dismantling of the wind farm. Importantly, it also accounts for the emissions the Project will help avoid by replacing fossil fuel-based electricity generation with clean, renewable energy. The emissions have been contextualised against the relevant UK carbon budgets, and a significance of effect has been assigned in line with the IEMA guidance.

7.3.1.3 The results highlight that the construction stage of the Project contributes the most to the lifecycle of the Project, due to the embodied carbon of the materials used and offshore vessel movements for construction and installation of design elements. The construction stage emissions have been estimated to be 9,338 kilotonne CO_2 equivalent ($ktCO_2e$), whereas the O&M stage emissions have been estimated as 310 $ktCO_2e$.

7.3.1.4 The contributions from these stages to the respective UK carbon budgets were estimated to be negligible and therefore the significance of the Project's effects on global climate as the receptor is concluded as **Minor Adverse** (**Not Significant**).

7.3.1.5 Additionally, the Project is expected to save carbon emissions of approximately 5,831,158 tCO_2e/year due to the nature of electricity generated being renewable and it is

expected that the wind farm will have offset its lifecycle GHG emissions after approximately five years of its operation. This is a direct net benefit of the Project which means that the overall significant of effect is assessed as **Beneficial** (**Significant**).

7.3.2 Considered environmental measures

7.3.2.1 GHG mitigation opportunities will continue to emerge as the design work progresses relating to the procurement of products and services for the construction, O&M and decommissioning stages.

- GHG emissions reduction opportunities will be identified and considered throughout the Project life cycle and will be implemented where confirmed to be technologically and commercially viable. This could include measures such as operational efficiencies and selection of products and services with lower emissions.
- Measures to minimise lifecycle GHG emissions from construction plant and equipment are set out in **Volume 4: CEMP**. Potential options could include the use of efficient and well-maintained plant and equipment and using mains electricity, if available, rather than diesel-fuelled portable generators, to reduce GHG emissions from fuel and energy consumption.
- **Volume 4: Outline CEMP** includes measures to minimise emissions from construction traffic. This will include measures such as consolidating deliveries where possible. Sustainable modes of travel for the construction workforce will be promoted. Offshore vessel movements will be programmed to maximise vessel operational efficiencies.

7.3.3 Likely significant effects

7.3.3.1 The Project provides an overall **Beneficial** (**Significant**) effect. This is due to the net GHG emissions benefits achieved through the renewable energy generation over the lifetime of the Project. The benefit of this generation is greater than the **Minor Adverse** (**Not Significant**) impacts identified in the Construction, O&M and Decommissioning stages of the Project lifetime.

Inter-related effects

7.3.3.2 Emissions of GHGs to the atmosphere have the potential to contribute to climate change, and therefore the effects are global and cumulative in nature. No inter-related effects are therefore identified.

Transboundary effects

7.3.3.3 Based on the knowledge of the baseline environment, the nature of planned works and the wealth of evidence on the potential for impact from such projects more widely, there are not considered to be any transboundary effects relating to GHG emissions.

Cumulative effects

7.3.3.4 The global atmosphere is the receptor for the GHG assessment. Emissions of GHGs to the atmosphere have the potential to contribute to climate change, and therefore the effects are global and cumulative in nature. This is considered in defining the receptor as high sensitivity. The GHG assessment is therefore considered to be inherently cumulative, and no additional consideration of cumulative effects is required.

7.4 Socio-economics

7.4.1 Overview

7.4.1.1 **Volume 1, Chapter 30: Socio-Economics** of the EIA Report examines the likely significant effects on socio-economic receptors that may be experienced as a result of the construction, O&M, and decommissioning of the Project.

7.4.1.2 The assessment has considered the likely significant effects of the Project on the following socio-economic receptors:

- Employment markets including Project's demand for labour and supply of labour to meet Project demand for workers with varying skillsets.
- Markets for materials, equipment and services including potential private sector suppliers such as local businesses as the Project will create a demand for these.
- Users of the land and marine environments affected such as agricultural and shipping businesses Project activities take place.
- The activity in the national, regional and local economy, represented by measures of Gross Value Added (GVA).
- People and communities living, working, visiting, travelling through, and otherwise experiencing areas in the vicinity of the Project. This is because Project activities may disrupt or alter the normal use of roads, public amenities and natural spaces and affect recreational and wellbeing benefits.
- Local people and businesses, particularly in the north east of Scotland as the Project will bring new employment and supply chain opportunities with benefits to communities and the local economy.

7.4.1.3 **Volume 1, Chapter 30: Socio-Economics** describes the socio-economic conditions in local and wider areas, including consideration of conditions in the nearest ports to the OAA (Peterhead and Fraserburgh) and in Aberdeenshire, Aberdeen City and areas across Scotland and its regions where relevant. Socio-economic profiles of council wards surrounding key ports that may be used by the Project are included, highlighting variations in employment, education, health, and deprivation.

7.4.1.4 Economic activity in Aberdeen City and Aberdeenshire makes up 10% of the GVA in Scotland's economy (£18.35 billion in 2023). Both areas show recovery post-COVID and consistently higher GVA per head than Scottish and UK averages.

7.4.1.5 The population in Aberdeenshire makes up 4.8% of Scotland's population and has experienced steady growth over 20 years and continued modest increases are projected. Household numbers have grown faster than population indicating rising housing demand from a preference for lower occupancy rates.

7.4.1.6 In the labour market, economic activity rates are high (Aberdeenshire 80.4%, Aberdeen City 77.9%), with low unemployment compared to national averages. Jobs density is lower in Aberdeenshire than Scotland overall, and pay levels are slightly above national averages. Aberdeenshire has strong industries in manufacturing and construction, while Aberdeen City is dominated by employment in health, oil and gas, and professional services.

7.4.1.7 Most areas of Aberdeenshire and Aberdeen City perform well in economic terms, but pockets of deprivation exist, especially in Peterhead and Fraserburgh for income, employment, housing, and access to services. Both areas have above-average qualification levels, supporting good potential for skilled workforce development. House prices in

Aberdeenshire remain stable and above Scottish averages but have declined in Aberdeen City. Health indicators are generally better than national averages, though local disparities exist.

7.4.1.8 Tourism is significant in the region, and there is good provision of community and leisure facilities, though rural areas experience access challenges.

7.4.1.9 Overall, the area has a relatively strong economy with localised challenges in coastal communities, relevant to the context for assessing Project impacts on employment, supply chains, and community wellbeing.

7.4.1.10 Stakeholder engagement to inform **Volume 1, Chapter 30: Socio-Economics** has been undertaken throughout the EIA process, through targeted meetings with advisory bodies and via questionnaires that were available to all stakeholders in all rounds of Statutory Consultation. The following organisations have been consulted: Aberdeenshire Council, MD-LOT, and the Marine Analytical Unit.

7.4.2 Embedded environmental measures

7.4.2.1 A range of environmental measures within the **Volume 3, Appendix 5.2** that relate to socio-economics are embedded as part of the Project design to remove or reduce significant environmental effects as far as possible.

7.4.2.2 Examples of these embedded environmental measures include the following:

- Adherence to the Supply Chain Development Statement in relation to use of local workforce and supply chains.
- Communication of working schedules to avoid and minimise disruption.
- Communication plan for community engagement and support.
- Customised plan for the decommissioning stage.
- Development, finalisation and implementation of a Socio-Economic Action Plan for the Project in order to maximise net economic benefits and contribute to community wealth building through relevant opportunities.

7.4.3 Likely significant effects

Overview

7.4.3.1 The Project will create significant socio-economic beneficial effects through job creation from demand for labour and activity in supply chains locally and in the wider region over both the 12 year construction and the 35 year operational stages for each phase of the Project. A subsequent decommissioning stage is also expected to generate further employment in Scotland.

7.4.3.2 Beneficial employment effects are anticipated to be concentrated and sustained, bringing employment stability in a context of uncertainty in relation to jobs in the oil and gas sector. The construction stage includes appreciable employment at a range of ports in Scotland and work elsewhere in the associated supply chains.

7.4.3.3 The O&M stage is anticipated to deliver a higher level of employment with enduring socio-economic benefits, improving workforce resilience and support. During the O&M stage, long-term jobs at ports may provide structural benefits and economic stability for

communities, particularly where there are areas of deprivation such as within Peterhead and Fraserburgh.

7.4.3.4 The use of land and marine areas experiences some disruption with minor impacts expected in the agriculture, shipping and commercial fishing sectors. Embedded measures are included that reduce adverse effects and enhance positive socio-economic outcomes, including the long term benefits to communities experiencing transition with growth in the offshore wind sector offsetting the decline in oil and gas industries.

Inter-related effects

7.4.3.5 No significant inter-related effects of greater significance compared to the effects considered alone were identified for socio-economics receptors from the construction, O&M and decommissioning of the Project.

Transboundary effects

7.4.3.6 No significant transboundary effects have been identified at this stage in relation to the Project on socio-economics receptors from construction, O&M, and decommissioning activities.

Cumulative effects

7.4.3.7 There are significant beneficial cumulative effects resulting from the high levels of growth in the offshore wind sector and the potential for transition away from the activities in the North Sea area in the oil and gas sector which are currently in decline. There are potential adverse cumulative effects related to commercial fishing for which there is expected to be mitigation through use of alternative fishing grounds (displacement).

7.5 Civil and military aviation

7.5.1 Overview

7.5.1.1 **Volume 1, Chapter 31: Civil and Military Aviation** of the EIA Report examines the likely significant effects that may be experienced by civil and military aviation receptors due to the offshore and onshore construction, O&M, and decommissioning of the Project. For example, offshore wind farm infrastructure can present a physical obstruction for low flying aircraft such as offshore helicopters and rotating wind turbine blades can have a detrimental effect on how aviation radars work.

7.5.1.2 The airspace above the Project is used by civil and military aircraft and lies within the Scottish Flight Information Region. This airspace is regulated by the Civil Aviation Authority (CAA). Low flying traffic in the vicinity of the Project could include helicopters flying between Aberdeen Airport and offshore oil and gas platforms, military low flying training and SAR operations. National Air Traffic Services (NATS) provides Air Traffic Services within this airspace and operates a network of radar facilities providing information for Air Traffic Control of both civil and military aircraft. The Project is in the vicinity of two NATS radars and a military Air Defence radar. The onshore export cable corridor is adjacent to Longside Airfield, a civil unlicensed aerodrome.

7.5.1.3 The assessment has considered impacts on civil and military aviation from the Project's offshore and onshore infrastructure during all three Project stages and impacts on civil and military radars during the O&M stage.

7.5.2 Embedded environmental measures

7.5.2.1 A range of environmental measures which relate to civil and military aviation are embedded as part of the Project design to remove or reduce significant environmental effects as far as possible. Examples of these embedded environmental measures include the following:

- Provision of the positions and heights of structures to the CAA and the Ministry of Defence (MOD) so that aeronautical charts can be updated.
- A **Volume 4: Outline Lighting and Marking Plan** containing specific requirements for lighting of wind turbines to increase their visibility.
- Notification of temporary offshore obstacles to civil and military aviation aircrews.
- The completion of a SAR Checklist.

7.5.3 Likely significant effects

Overview

7.5.3.1 With the appropriate embedded environmental measures in place, the effects of the impacts on civil and military aviation from offshore and onshore infrastructure are considered to be minor for the construction, (O&M) and decommissioning stages. **Minor Adverse** (**Not Significant**) in EIA terms.

7.5.3.2 During the (O&M) stage the impacts of wind turbines on the NATS radars at Allanshill and Perwinnes, and the AD radar at Buchan would result in effects of **Major Adverse** (**Significant**) in EIA terms.

7.5.3.3 Once secondary mitigation solutions are agreed and implemented in consultation with NATS and the MOD, the effects on these radars would be reduced to **Minor Adverse** (**Not Significant**) in EIA terms.

Inter-related effects

7.5.3.4 No significant inter-related effects of greater significance to the effects considered alone were identified for civil and military aviation receptors from construction, O&M and decommissioning activities.

Transboundary

7.5.3.5 No significant transboundary effects have been identified at this stage in relation to the Project on civil and military aviation receptors from construction, O&M and decommissioning activities.

Cumulative effects

7.5.3.6 No significant cumulative effects have been identified in relation to potential effects of the Project for civil and military aviation receptors from construction, O&M and decommissioning activities.

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9. Glossary of terms and abbreviations

9.1 Abbreviations

Acronym	Definition
AC	Alternating Current
AW	Ancient Woodland
CAA	Civil Aviation Authority
ECOW	Ecological Clerk of Works
EGL	Eastern Green Link
EMF	Electromagnetic Field
EIA	Environmental Impact Assessment
GHG	Greenhouse Gas
GVA	Gross Value Added
GW	gigawatt
GWDTE	Groundwater Dependent Terrestrial Ecosystems
HDD	Horizontal Directional Drilling
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
IAQM	Institute of Air Quality Management
IEMA	Institute of Environmental Management and Assessment
INNS	Invasive Non-Native Species
km	Kilometre
kV	Kilovolt
m	Metre
MD-LOT	Marine Directorate – Licensing Operations Team
MHWS	Mean high-water springs
MLWS	Mean low-water springs
MOD	Ministry of Defence
MW	Megawatt

Acronym	Definition
NATS	National Air Traffic Services
NCMPA	Nature Conservation Marine Protected Area
NE7	Northeast 7
NESO	National Electricity System Operator
nm	Nautical miles
NTS	Non-Technical Summary
NVMP	Noise and Vibration Management Plan
O&M	Operation and Maintenance
OAA	Option Agreement Area
OFTO	Offshore Transmission Operator
PM	Particulate Matter
PPiP	Planning Permission in Principle
PWS	Private Water Supplies
Q&A	Question and Answer
RCP	Reactive Compensation Platform
RSPB	Royal Society for the Protection of Birds
SAR	Search and Rescue
SDC	Subsea Distribution Centre
SEPA	Scottish Environment Protection Agency
SLA	Special Landscape Area
SPA	Special Protection Area
SPP	Species Protection Plan
SPR	ScottishPower Renewables
SSEN	Scottish and Southern Electricity Networks
SSSI	Site of Special Scientific Interest
UK	United Kingdom
UXO	Unexploded Ordnance
WTG	Wind Turbine Generator

Acronym	Definition
ZOI	Zone of Influence

9.2 Glossary of terms

Term	Definition
Aberdeenshire Council	One of 32 divisions of Scotland, designated as a Council area for the purposes of local government, covering Aberdeenshire.
Array cables	Array cables will be used to connect the WTGs to the offshore substation. This will be via other WTGs if in a string or loop arrangement, or to a subsea distribution centre, and then onto the offshore substation if in a star configuration. The cables will have a requirement to withstand both dynamic conditions at the floating units as well as static lay and burial in or on the seabed.
Construction Environmental Management Plan	A plan that sets out the standards and procedures to which developers and contractors must adhere when undertaking construction of major projects. This will assist with managing the environmental impacts and will identify the main responsibilities and requirements of developers and contractors.
Cumulative Effects Assessment	Assessment of effects as a result of the incremental changes caused by other past, present and reasonably foreseeable human activities and natural processes together with the Project.
Decommissioning	The period during which a development and its associated processes are removed from active operation.
Environmental measures	Measures that are proposed to prevent, reduce and where possible offset any significant adverse effects (or to avoid, reduce and if possible, remedy identified effects).
Environmental Impact Assessment	The process of evaluating the likely significant environmental effects of a proposed project or development over and above the existing circumstances (or 'baseline').
Environmental Impact Assessment Report	The outcome of the Environmental Impact Assessment (EIA) process is reported within a document called an EIA Report.
Environmental Impact Assessment Regulations	Terminology used in this EIA Report to refer to four sets of regulations: • The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017; • The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017; • The Marine Works (Environmental Impact Assessment) Regulations 2007; and • The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.
Export Cable Corridor	The broad linear area through seabed (seaward of Mean High Water Springs (MHWS)) and land (landward of MHWS) connecting the Project OAA offshore to the proposed point of connection onshore, and within which electrical export cables will be located.

Term	Definition
Gigawatt	A unit of electrical power equivalent to one billion Watts.
Grid connection cables	These are the underground cables that connect from the proposed onshore substations to the grid connection point at the SSEN Netherton Hub.
Intertidal	The area of a seashore that is covered by water at high tide and exposed to the air at low tide.
Horizontal Directional Drill	An engineering technique for laying cables that avoids open trenches by drilling between two locations beneath the ground's surface.
Institute of Environmental Management and Assessment	International membership organisation for environment and sustainability professionals.
Landfall	The generic term applied to the entire coastal area between the limit of MLWS and the position of the transition joint bays located above the limit of MHWS, inclusive of all construction works, including the offshore and onshore export cable corridor, intertidal working area and landfall temporary construction compound.
Likely significant effects	It is a requirement of the EIA Regulations to determine the likely significant effects of the Project on the environment which should relate to the level of an effect and the type of effect.
MarramWind Limited ('the Applicant')	MarramWind Offshore Wind Farm (hereafter referred to as 'the Project') is wholly owned by ScottishPower Renewables UK Limited (SPR). MarramWind Limited, a subsidiary of SPR, is the Applicant for the Project.
Marine Directorate – Licencing Operations Team	The regulator for determining marine licence applications on behalf of the Scottish Ministers in the Scottish inshore region (between 0 and 12 nautical miles) under the Marine (Scotland) Act 2010, and in the Scottish offshore region (between 12 and 200 nautical miles) under the Marine and Coastal Access Act 2009.
Marine licence	Licence required for certain activities in the marine environment and granted under either the Marine and Coastal Access Act 2009 or the Marine (Scotland) Act 2010.
Maximum Design Scenario	The maximum design scenario represents the worst-case scenario for each aspect whilst allowing the flexibility to make improvements in the future in ways that cannot be predicted at the time of submission of the planning, Section 36 consent and marine licence applications.
Mean High Water Springs	The average throughout a year of the heights of two successive high waters during those periods of 24 hours (approximately once a fortnight) when the tidal range is greatest.
Mean Low Water Springs	The average throughout a year of the heights of two successive low waters during those periods of 24-hours (approximately once a fortnight) when the tidal range is greatest.
Megawatts	Unit of electrical power equal to one million Watts.
Metre	Unit of lateral measurement equivalent to 100 centimetres.

Term	Definition
National Electricity System Operator's Holistic Network Design	To provide a coordinated onshore and offshore design for a 2030 network to meet government objectives of connecting 40 gigawatts (GW) of offshore wind in Great Britain by 2030, including 11GW in Scotland as well net zero by 2050 for GB and 2045 for Scotland. The HND aims to provide an economic, efficient, operable, sustainable and coordinated National Electricity Transmission System (NETS) including the onshore and offshore assets required to connect offshore wind and considering internal interconnectors.
Offshore	The offshore elements of the Project refer to works seaward of Mean High Water Springs (MHWS).
Onshore export cable	These are underground cables that connect from the landfall transition joint bays to the onshore substations. As with the offshore export cables, the type and number of cables will depend on the transmission technology used. Cables are typically installed in ducts in a standard buried trench arrangement where possible. Horizontal Directional Drilling (HDD) or other tunnelling methods may be necessary to cross sensitive features such as watercourses, roads and pipelines.
Offshore substation	Offshore substations are installed to collect the energy generated by the WTGs and house transmission equipment. The latter is required to convert the wind farm electricity to higher voltages necessary for long distance transmission through subsea cables to the onshore grid. Offshore substations can be above the sea surface on a platform and/or subsea. Several platforms may be required for the Project.
Onshore	The onshore elements of the Project refer to works landward of Mean Low Water Springs (MLWS).
Offshore export cable	Subsea export cables connect the offshore substation(s) to the landfall site(s) where a transition joint bay links the offshore subsea cables to the onshore underground cables. This cable system is necessary to export power from the offshore wind farm through the onshore substation to the existing grid network.
Onshore substations	Three new onshore substations are required to transform / convert the onshore export cable voltage to the 400kV required to connect to the proposed SSEN Netherton Hub substation.
Option Area Agreement	Term for the wind farm site upon the seabed at a location specified in the Option Agreement between the Crown Estate Scotland and a developer. It is the agreement that allows the developer the rights to undertake such tests, survey and site investigations that do not entail the temporary or permanent installation of any works or structures on the seabed.
Planning Permission in Principle	PPiP establishes the acceptability of a type of development or land use on a site without requiring a significant level of detail about the design and implementation of a development proposal. This approach is typically used for major development proposals to avoid the initial high costs of detailed design work and to retain design flexibility. A PPiP application only seeks initial consent for, as a minimum, a proposed land use and associated suite of high-level development parameters (including access from a public road) within a defined site boundary. All detailed design and implementation matters would be deferred to subsequent applications for Approval of Matters Specified in Conditions (AMSC).

Term	Definition
Reactive Compensation Platform	For HVAC transmission, there is an upper limit of offshore export cable route length, beyond which the electrical losses incurred during transmission become prohibitive. This limit can be increased using reactive power compensation equipment connected through a separate substation(s) along the export cable route, typically close to the mid-point between the offshore substation and onshore substations.
Red Line Boundary	The Red Line Boundary is a geographical area within which the offshore wind farm; associated onshore and offshore infrastructure will be located. It represents the boundary identified for the relevant planning and consent applications.
Scoping Opinion	A Scoping Opinion is adopted by the Planning Authority and Scottish Ministers for a proposed project.
Scoping Report	A report that presents the findings of an initial stage in the Environmental Impact Assessment process.
Scottish Government Marine Directorate (formerly Marine Scotland)	Civil service directorate for Scotland, which is responsible for the integrated management of Scotland's seas.
ScottishPower Renewables UK Limited	Part of the Iberdrola group and 100% owner of MarramWind Ltd.
Scour	A localised sediment erosion feature caused by local enhancement of flow speed and turbulence due to interaction with an obstacle.
Section 36 consent	Consent that can be granted under section 36 of the Electricity Act 1989 for the construction or extension, and operation, of an electricity station.
Statutory stakeholder	A stakeholder who must be given opportunity to engage with the Project as the Project design develops, as required under the relevant consenting regime(s).
Subsea distribution centres	Subsea distribution centres comprise a foundation support structure and protection structure. The subsea distribution centres allow cables from multiple WTGs to connect, with a single array cable then going from the subsea distribution centre to the offshore substation.
Subsea substations	Subsea substations comprise of a foundation support structure and protection structure, which is secured subsea to support associated distribution equipment. Given the access restrictions from being subsea they will be designed for ease of access and consider the need for O&M activities throughout their life.
The Crown Estate Scotland	The public corporation of the Scottish government that is responsible for the management of land and property in Scotland, as owned by the monarch "in right of the Crown".
The Project	The MarramWind Offshore Wind Farm that is the subject of this EIA Report, as described in **Volume 1, Chapter 4: Project Description.**
Transition joint bay	Transition joint bays are permanent, below ground infrastructure, where the offshore and onshore export cables are jointed together.

Term	Definition
Unexploded Ordnance	Explosive weapons (for example bombs, shells, grenades, land mines, naval mines) that did not explode when they were employed or discarded and still pose a risk of detonation, potentially many decades later.
United Kingdom	The United Kingdom of Great Britain and Northern Ireland, comprising England, Scotland, Wales and Northern Ireland.
Wind Turbine Generators (WTG)	WTGs convert wind energy to electricity. Each floating WTG will comprise a tower (potentially assembled in sections), a rotor with three blades attached to a nacelle. The nacelle typically houses a gearbox, generator, converter, transformer, and control equipment.
WTG floating unit	Each WTG is supported by a floating unit that is positively buoyant and moored in position on the seabed. A number of floating unit concepts are currently under consideration.
WTG station keeping system	Each WTG on its floating unit will be secured in place using a station keeping or mooring system, involving anchors and mooring lines. Typically, multiple mooring lines will spread out radially from the floating structure, each ending in an anchor point on the seabed.

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