Onshore Design and Access Statement

MarramWind Offshore Wind Farm

December 2025

MarramWind

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Contents

1. Introduction

1.1.1.1 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.

1.1.1.2 The Project is a proposed floating wind farm located in the North Sea, with a grid connection capacity of up to 3 gigawatts (GW). The location of the Project is determined by the Option Agreement Area (OAA), which is the spatial boundary of the Northeast 7 (NE7) Plan Option within which the electricity generating infrastructure will be located. The NE7 Plan Option is located north-east of Rattray Head on the Aberdeenshire coast in north-east Scotland, approximately 75 kilometres (km) at its nearest point to shore and 110km at its furthest point. An Option to Lease Agreement for the Project within the NE7 Plan Option was signed in April 2022.

1.1.1.3 This Onshore Design and Access Statement (DAS) has been prepared to support an application to Aberdeenshire Council for Planning Permission in Principle (PPiP) consent under The Town and Country Planning (Scotland) Act 1997, for the onshore infrastructure landward of Mean Low Water Springs (MLWS).

1.1.1.4 The PPiP application is for the construction, operation and maintenance (O&M) and decommissioning of the Project’s onshore infrastructure which includes the landfall(s), the onshore export cable corridor and the onshore substations.

1.1.1.5 A more detailed description of the Project is provided in **Volume 1, Chapter 4: Project Description** of the Environmental Impact Assessment (EIA) Report.

1.1.1.6 All onshore infrastructure, for which consent is being sought, falls within the Onshore Red Line Boundary which is shown in **Appendix A, Figure 1 Onshore Red Line Boundary and indicative onshore infrastructure**.

1.1.1.7 The remainder of this Report is structured as follows:

- **Section 2** outlines the purpose of the DAS, referring to the legislation and / or planning policy that establishes the requirement for a DAS and consequently what needs to be covered in a DAS;
- **Section 3** provides an overview of the onshore elements of the Project;
- **Section 4** provides details on the design considerations which have been considered when designing the onshore aspects of the Project;
- **Section 5** outlines the access considerations which have been considered as part of the onshore elements of the Project; and
- **Section 6** provides a summary of the Report.

2. Purpose of the Onshore Design and Access Statement

2.1 Purpose of the Onshore Design and Access Statement

2.1.1.1 Under the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013, planning applications submitted under the Town and Country Planning (Scotland) Act 1997, which governs onshore development, must include a DAS for proposals classified as 'national' or 'major' developments.

2.1.1.2 The Project qualifies as a national development under National Planning Framework 4 (NPF4) (2023), specifically under National Development 3: Strategic Renewable Electricity Generation and Transmission Infrastructure.

2.1.1.3 While a DAS is not mandatory for applications for PPiP, its inclusion was identified as a requirement in the Aberdeenshire Council Pre-Application Advice Report dated 19 December 2024. Accordingly, the Applicant has opted to submit a DAS alongside the PPiP application.

2.1.1.4 Following pre-application discussions with Aberdeenshire Council, the Applicant has agreed to submit this DAS in support of the Planning Permission in Principle (PPiP) application. While a DAS is not a statutory requirement for PPiP applications, its inclusion is considered beneficial to provide clarity on design matters and to support the overall quality and transparency of the application.

2.1.1.5 This DAS aligns with the requirements set out within Regulation 13 of the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013 which require:

- an explanation of the design principles and concepts that have been applied to the proposal; and
- a description of how issues relating to access to the development have been addressed, including inclusive access and connectivity.

2.1.1.6 These requirements are addressed throughout this DAS:

- Design principles and concepts are set out in **Section 4**, including the design evolution process, project-specific design principles, landscape and visual considerations, and the mitigation hierarchy. Further detail is provided in **Volume 1, Chapter 3: Site Selection and Alternatives** and **Volume 1, Chapter 4: Project Description**.
- Access considerations are detailed in **Section 5**, which covers site access, public access, and measures to ensure accessibility and inclusivity. Supporting information is provided in **Volume 1, Chapter 26: Traffic and Transport** and **Volume 4: Outline Construction Traffic Management Plan**.

2.1.1.7 This document provides a tool to communicate how the requirements for good design and access provision have been considered for the Project.

2.1.1.8 The DAS supports the Application for the Project and should be read in conjunction with the EIA Report, **Onshore Planning Statement** and supporting documentation. Specially, the following chapters of the EIA Report should be referred to:

- **Volume 1, Chapter 2: Legislation and Policy Context;**
- **Volume 3, Appendix 2.1: Planning Policy Framework;**

- **Volume 1, Chapter 3: Site Selection and Alternatives;**
- **Volume 1, Chapter 4: Project Description;**
- **Volume 1, Chapter 19: Ground Conditions and Contamination;**
- **Volume 1, Chapter 20: Water Resources and Flood Risk;**
- **Volume 1, Chapter 22: Land Use;**
- **Volume 1, Chapter 23: Terrestrial Ecology and Ornithology**;
- **Volume 1, Chapter 24: Onshore Archaeology and Cultural Heritage;**
- **Volume 1, Chapter 25: Onshore Noise and Vibration:**
- **Volume 1, Chapter 26: Traffic and Transport;** and
- **Volume 1, Chapter 27: Landscape and Visual.**

2.2 Legislation and policy

2.2.1.1 In the Scottish context, the statutory development plan comprises NPF4 (2023) and the relevant Local Development Plan (LDP) in this case the Aberdeenshire LDP (2023a). These documents provide the spatial strategy and policy framework within which the Project is assessed. Section 25 of the Town and Country Planning (Scotland) Act 1997 requires decisions to be made in accordance with the statutory development plan unless material considerations indicate otherwise, establishing a presumption in favour of development that accords with the plan. The Planning (Scotland) Act 2019 further reinforces this plan-led approach by elevating the status of NPF4 (2023) and introducing a statutory purpose for planning: to manage the development and use of land in the long-term public interest.

2.2.1.2 **Volume 1, Chapter 2: Legislation and Policy Context** considers the relevant planning legislation and policy context against which the Project will be delivered. An assessment of the Project against this relevant legislation and policy is presented within the accompanying **Onshore Planning Statement**.

2.2.1.3 **Volume 3, Appendix 2.1** offers a comprehensive summary of international, national, marine, and local planning policies pertinent to the EIA, providing essential context for the legislative and policy considerations addressed in **Volume 1, Chapter 2: Legislation and Policy Context**.

2.2.1.4 This DAS therefore focuses on the applicable DAS policies and guidance, demonstrating how the Project responds to these requirements. In doing so, it reflects the principles and expectations set out in the statutory development plan.

2.2.1.5 The applicable DAS policies within NPF4 (2023) comprise of:

- **Policy 1:** Tackling the climate and nature crises – ensuring the development contributes to net zero, supports climate adaptation, and delivers positive effects for biodiversity;
- **Policy 2:** Climate Mitigation and Adaptation – demonstrating how the design responds to climate challenges;
- **Policy 11:** Energy – supporting well-sited, well-designed renewable energy infrastructure and associated grid connections, with careful consideration of landscape, community, and access impacts;
- **Policy 14:** Design, Quality and Place – requiring high-quality, context-responsive design;

- **Policy 15:** Local Living and 20 Minute Neighbourhoods – promoting walkable, accessible environments;
- **Policy 18:** Infrastructure First – ensuring appropriate access and infrastructure provision;
- **Policy 20:** Blue and Green Infrastructure – integrating landscape, biodiversity, and accessible green space into the design, supporting active travel and climate resilience; and
- **Policy 23:** Health and Safety – promoting safe and inclusive access for all users.

2.2.1.6 The applicable DAS policies within Aberdeenshire LDP (2023a) comprise of:

- **Policy P1**: Relates to the Layout, Siting and Design of new developments, guiding how proposals should be developed to be distinctive, safe, and visually appealing while respecting local context and character.
- **Policy P2:** Open space and access in new development - Requires new developments to provide high-quality, accessible open space and ensure good connectivity for pedestrians and cyclists;
- **Policy P4:** Hazardous and potentially polluting developments and contaminated land - Includes requirements for site layout and design to minimise risk and impact;
- **Policy E2:** Landscape - Requires developments to be sited, designed, and landscaped to fit with the landscape character and setting;
- **Policy HE1:** Protecting listed buildings, scheduled monuments and archaeological sites - Design must respect and enhance the setting of heritage assets;
- **Policy HE2:** Protecting historic, cultural and conservation areas - Emphasises design quality and compatibility with conservation areas;
- **Policy RD1:** Providing suitable services - Requires developments to be designed for safe and convenient access for all users, including those with disabilities;
- **Policy PR1:** Protecting important resources - Includes requirements for access to and protection of important resources such as core paths and public rights of way; and
- **Policy C2:** Renewable energy - For renewable energy developments, requires consideration of access for construction, O&M and decommissioning.

2.2.1.7 Guidance from Planning Advice Notes (PAN) 68: Design Statements and PAN 78: Inclusive Design has informed the development of this DAS and the overall design approach for the Project.

2.2.1.8 Following the Planning (Scotland) Act 2019, Supplementary Planning Guidance and Supplementary Guidance no longer form part of the statutory development plan and are not now considered material considerations. Nevertheless, these documents continue to play a significant role in shaping the Project's design, providing important context and guidance that has informed the development approach. This includes the following as identified in the Aberdeenshire Council Pre-Application Advice Report (Aberdeenshire Council, 2024):

- PA1012-01 Aberdeenshire forestry and woodland strategy (Aberdeenshire Council, 2016);
- PA2023-10 Securing positive effects for biodiversity (Aberdeenshire Council, 2023b);
- PA2023-12 Outdoor access and development (Aberdeenshire Council, 2023b);

- PA2023-13 Pipelines and hazardous development zones (Aberdeenshire Council, 2023b);
- PA2023-15 SP=EED (Effective Engagement and Delivery) (Aberdeenshire Council, 2023e);
- PA2023-17 Baseline ecological survey (Aberdeenshire Council, 2023f); and
- PA2023-20 Trees and development (Aberdeenshire Council, 2023g).

2.2.1.9 The design rationale underpinning the Project is detailed in **Section 4** and sets out how the Project meets the requirements of planning policy and guidance, aligning with PAN 68: Design Statements (Scottish Government, 2003) and the Scottish Government's Designing Places policy statement (2001). **Section 5** explores the measures which have been implemented through the Project's design to ensure accessibility and inclusivity of the elements proposed which will be available to the public. Whilst the majority of the infrastructure proposed as part of the Project will not be publicly accessible, and therefore has not been designed as such, where it is expected that the public will interact with elements of the Project, these features have been designed in accordance with the requirements detailed in PAN 78: Inclusive Design (Scottish Government, 2006).

2.2.1.10 The following principles are derived from PAN 78 and noted in guidance notes for planning permission forms (ePlanning.scot, 2025) to guide developers in achieving inclusive design:

- *"Understanding the basics of inclusive design and being aware of the social and commercial benefits of inclusive design. These will not be limited to the design of the development and will include, for example, the location of the building on the plot, how steep the ground is, the ground surface, the relationship to adjoining buildings and local transport links.*
- *Adopting a policy that means inclusive design must be part of the brief to the designer or architect.*
- *Appointing an access specialist if your designer does not have the necessary knowledge or experience.*
- *Talking to the relevant authorities as early as possible and being prepared to amend designs, as necessary, to deal with any issues raised. This role could also be carried out by the designer;*
- *Making sure the Application follows inclusive design principles throughout the construction stages; and*
- *Consider how the completed development will be used and managed. Many barriers can be overcome by identifying problems at an early stage in the design".*

2.2.1.11 Stakeholder engagement and pre-application consultation (PAC) has shaped the design, and this is discussed further in **Section 4.7**.

3. Overview of the Project (Onshore)

3.1 Background to the Project (Onshore)

3.1.1.1 The Onshore Red Line Boundary and indicative onshore infrastructure footprint is illustrated in **Appendix A, Figure 1** of this Report and includes the following:

- landfall(s) - the infrastructure associated with the landfall(s) located above MLWS;
- underground onshore export cables running from the landfall(s) to the onshore substations;
- onshore substations co-located at one site;
- underground grid connection cables (connecting the onshore substations to the grid connection point at Scottish and Southern Electricity Networks (SSEN) Netherton Hub;
- tie-in to grid connection point (SSEN substation at SSEN Netherton Hub, which is a separate project and does not form part of the consenting applications which this EIA relates to); and
- associated temporary construction areas, including for example construction compounds, access tracks and haul roads.

3.1.1.2 The onshore elements of the Project are located in Aberdeenshire, Scotland. The Onshore Red Line Boundary has an elevation ranging from approximately 0.8 metres (m) above ordnance datum (AOD) at its lowest point in the eastern area of the Project, rising to approximately 59.3m AOD in the southern area of the Project.

3.1.1.3 The onshore infrastructure is predominantly situated on agricultural land, with residential areas at St Fergus to the west, and Inverugie to the south-east. The larger town of Peterhead also lies to the east / south-east of the Project, and scattered dwellings are present in the surrounding area. Longside Airfield is located directly to the west of the onshore export cable corridor before crossing the A950 and is located to the north of the onshore substations.

3.1.1.4 The Project has good accessibility from the A950 road to the west of Peterhead and from the A90, which intersects the Project in the north.

3.1.1.5 There are numerous watercourses present within the Onshore Red Line Boundary; these range in size from field drainage ditches to the River Ugie and its wider catchment. The majority of these watercourses drain into the River Ugie, which is formed from the confluence of the North and South Ugie Waters and flows in a predominantly eastern trajectory before discharging into the North Sea, directly north of Peterhead, Aberdeenshire.

3.1.1.6 The Applicant intends to apply the design envelope approach, also known as the 'Rochdale Envelope', to the PPiP and associated EIA Report, which will provide the reasonable worst-case parameters or scenario that will encompass the flexibility required for relevant Project infrastructure. The provision of a design envelope is intended to identify key design assumptions to enable the environmental assessment to be carried out whilst retaining enough flexibility to accommodate further refinement during detailed design.

3.1.1.7 A more detailed description of the onshore elements of the Project is provided in **Volume 1, Chapter 4: Project Description**.

3.2 Programme

3.2.1 Construction

Construction programme

3.2.1.1 As detailed in **Volume 1, Chapter 4: Project Description**, given the scale of the Project, a phased approach to the delivery of the Project is proposed. This Chapter provides more of a detailed justification for delivering the Project in a phased manner.

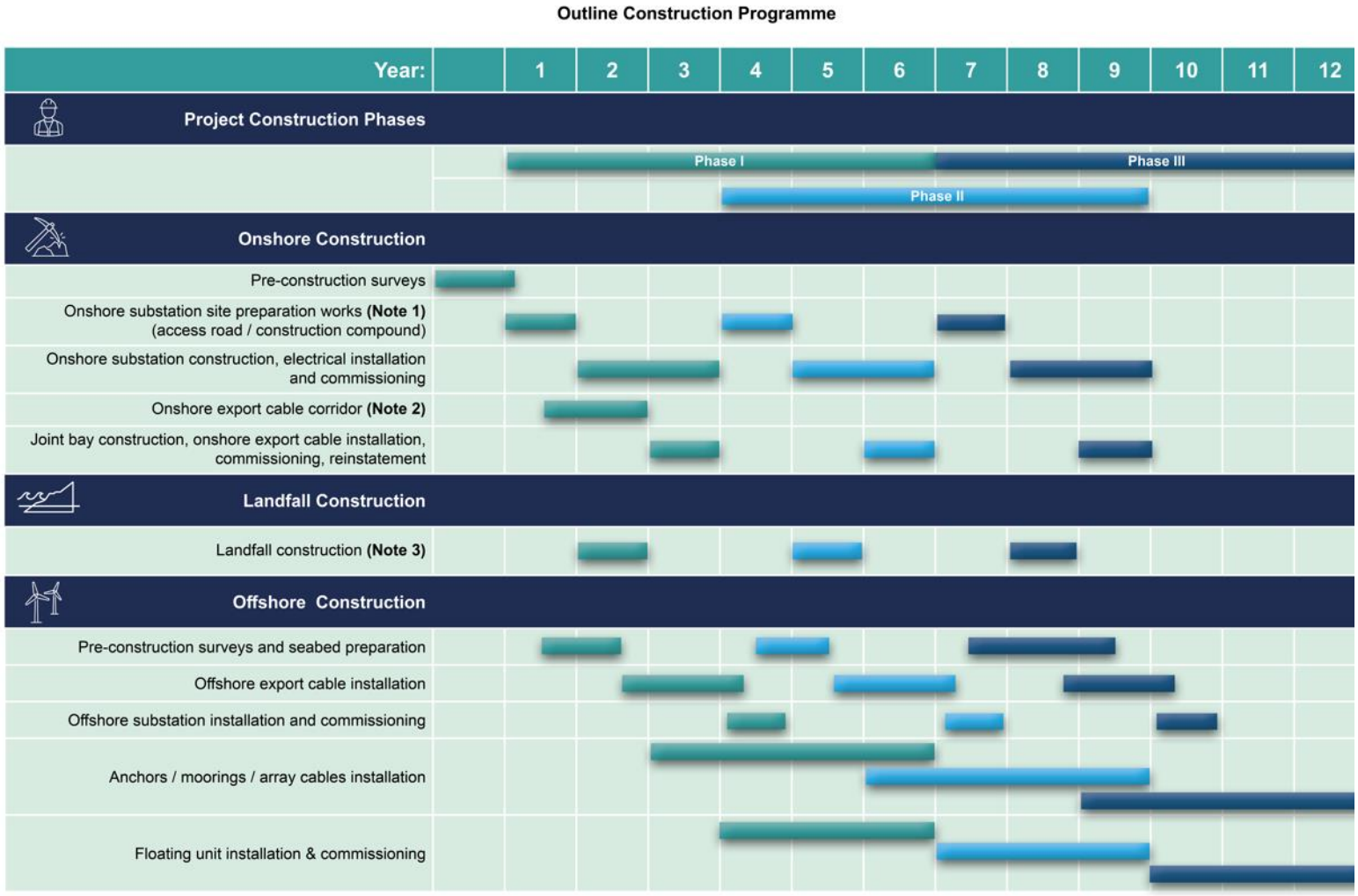
3.2.1.2 An indicative construction programme for the Project is presented in **Plate 3.1.** The programme illustrates the anticipated duration of the main construction / installation activities by infrastructure component.

3.2.1.3 The overall duration of construction of the offshore infrastructure is anticipated to be up to 12 years. This will be subject to the final grid connection date, supply chain discussions and further site surveys (pre-consent).

3.2.1.4 A shorter period within the 12 years is expected for construction of the onshore infrastructure; in the range of up to nine years.

3.2.1.5 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 3.1 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.

Construction timing

3.2.1.6 As secured in **Volume 4: Outline Construction Environmental Management Plan**, core working hours for onshore construction works for the Project are as follows:

- 08:00 to 18:00 hours Monday to Friday; and
- 08:00 to 13:00 hours on Saturday.

3.2.1.7 Prior to and following the core working hours Monday to Friday, a 'shoulder hour' for mobilisation and shut down will be applied (07:00 to 08:00 and 18:00 to 19:00) for which restrictions are described further in **Volume 4: Outline Construction Environmental Management Plan**. No activity outside of these hours, including Sundays, public holidays or bank holidays will take place apart from under the following circumstances:

- where continuous periods (up to 24-hours, seven days per week) of construction work are required for horizontal directional drill (HDD (or similar trenchless technique)). In relation to trenchless crossings, HDD (or similar trenchless technique) has been presented in the EIA. Whilst other trenchless methods are available, HDD (or similar trenchless technique) is presented herein as it is likely to have the largest construction footprint;
- for other works requiring extended working hours such as concrete pouring which will require the relevant planning authority to be notified at least 72 hours in advance;
- for the delivery of abnormal loads to the connection works, which may cause congestion on the local road network, where the relevant highway authority has been notified prior to such works 72 hours in advance; or
- as otherwise agreed in writing with the relevant planning authority.

3.2.2 Operation and maintenance

3.2.2.1 It is anticipated that the first phase of the Project would become fully operational in 2037 following commissioning of the wind turbine generators 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.

3.2.2.2 The Project is committed to ensuring the long-term reliability and performance of the wind farm through a comprehensive and well-planned O&M strategy. The strategy will be designed to minimise environmental impact while maintaining operational efficiency. A comprehensive O&M strategy that includes regular inspections, safety protocols, and environmental management plans will be adopted.

3.2.2.3 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.

3.2.2.4 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.

3.2.2.5 Maintenance practices for cables connecting to the SSEN Netherton Hub will follow the same protocols as those used between landfalls and substations.

3.2.2.6 Additional detail on the O&M stage, commitments and activities has been included in **Volume 1, Chapter 4: Project Description**.

3.2.3 Decommissioning

3.2.3.1 The decommissioning stage will commence at the end of the operational lifetime of the Project. The decommissioning duration of the onshore infrastructure may take the same amount of time as construction of the Project, up to nine years, although this indicative timing may reduce. Further detail on the decommissioning timings can be found in **Volume 1, Chapter 4: Project Description**.

3.2.3.2 Prior to decommissioning taking place, an onshore decommissioning plan will be submitted and agreed Aberdeenshire Council before decommissioning works commence, following cessation of commercial operation.

3.2.3.3 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 (FOC) 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.

3.2.3.4 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.

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

4. Design Considerations

4.1 Design principles overview

4.1.1.1 The design of the Project (Onshore) has evolved through the development of Scoping, Statutory Consultation, and the EIA Report, in accordance with the legislative framework and polices, and in consideration of all applicable environmental, consenting, engineering and technical considerations.

4.1.1.2 The design evolution process adopted for the Project is a fundamental element of the EIA. The process is iterative and has led to opportunities for the development of environmental measures that have been embedded directly into the design of the Project. These are referred to as 'embedded environmental measures' (discussed in further detail in **Volume 1, Chapter 5: Approach to the EIA**). The process has involved engagement and consultation, providing opportunities for stakeholders to provide feedback and to understand and influence the design as it progresses.

4.1.1.3 The Project's design evolution has aimed to be systematic, analytical, impartial, consultative and iterative allowing opportunities for environmental and planning policy constraints to be addressed, alongside the technical and economic considerations for the Project. The Project design has evolved considering design parameters including the onshore export cable corridor, the location of the onshore substations and the use of trenchless crossings at the landfall(s) and major road, watercourse crossings (such as the River Ugie) and utilities crossings, see **Volume 3, Appendix 4.1: Crossing Register** for further details.

4.1.1.4 The establishment of the Onshore Red Line Boundary considered hard constraints, including the avoidance of pipelines via trenchless crossings where necessary, excluding large woodland areas where possible, and ensuring appropriate buffers were maintained around listed buildings and scheduled monuments. Where future road access may be required, the Onshore Red Line Boundary was expanded in localised areas to ensure this could be achieved.

4.1.1.5 A detailed appraisal of the site selection process, alternatives considered, and justification of conclusions reached can be found in **Volume 1, Chapter 3: Site Selection and Alternatives**.

4.1.2 Project specific design principles

4.1.2.1 The core objective of the Project is to deliver one of the first commercial scale floating offshore wind farms to support the transition to net zero, in line with Scottish and UK Government targets. This is to be undertaken in an economic and efficient manner, compliant with relevant legislation, and with due regard for environmental impact and stakeholders' interests. This core objective underpins the Project design principles, design decisions and the refinement of the design envelope through site selection and the consideration of alternatives.

4.1.2.2 Based on this objective, the site selection and consideration of alternatives process has been informed by the following key design principles:

- selection of the shortest feasible onshore export cable corridor to minimise environmental and amenity impacts and reduce transmission losses;
- avoidance of key sensitive features where possible and adherence to the mitigation hierarchy where avoidance is not feasible;

- avoidance or minimisation of interaction with features with associated construction risk or technical challenges;
- avoidance or minimisation of impact on populated areas and sensitive stakeholder locations such as schools and hospitals, in line with the mitigation hierarchy; and
- identification of site and corridor options of sufficient size to accommodate the required infrastructure.

4.2 Design principles relating to landscape and visual

4.2.1.1 An Outline Landscape and Architectural Strategy (OLAS) (**Volume 4, Outline Landscape and Architectural Strategy**) has been produced along with the EIA Report with the aim of providing effective landscape mitigation for the onshore Project infrastructure (above ground) and to avoid and reduce significant and adverse landscape and visual effects.

4.2.1.2 Considering the large scale of development, including the potential for cumulative development, the potential locations of the onshore infrastructure elements were iteratively assessed. Site visits and desk-based analysis informed site selection and design principles. A landscape and architectural design approach has been chosen to deliver an appropriate level of environmental mitigation as required by both national and local planning policies comprising the Development Plan.

4.2.1.3 The OLAS provides a vision for how the onshore infrastructure would 'fit' within its landscape context. The project design has considered the onshore elements of the Project, including the Project infrastructure, buildings and landscaping proposals to ensure these 'work together' and provide a sympathetic solution that will mitigate and enhance the rural landscape context and local environment.

4.2.1.4 Four key aspects governed the development of the outline landscape design plans:

- **functionality** – the onshore elements of the Project, notably the onshore substations, must function to the necessary technical standards / requirements and constraints as communicated by the engineering team, noting in particular access, circulation, construction / O&M stage, climate resilience, safety and security amongst others;
- **phasing** – the design of the onshore elements considers advanced and pre-construction works, initial construction and O&M as well as the need for phased development;
- **onsite connectivity** – a number of the technical and environmental criteria are interrelated, and various components will be multi-purpose / multi-functional with the potential to realise multiple opportunities for mitigation and enhancement; and
- **offsite connectivity** – similarly opportunities and requirements for 'offsite' activity seeks to realise multiple opportunities for mitigation and enhancement, where they can be mutually beneficial to the Project.

4.2.1.5 The principal aim of the OLAS is to provide 'best fit' and integration of the onshore substations with their landscape setting. The scale and height of the onshore substations mean that the landscape and visual effects cannot be fully mitigated by conventional approaches such as screen planting and therefore the OLAS includes alternative approaches such as architectural design solutions.

4.2.1.6 As detailed in **Volume 4, Outline Landscape and Architectural Strategy**, a number of design principles in relation to landscape and visual effects have been identified. In summary these include the following:

- **Design Principle 1**: controlling scale and form – measures to mitigate landscape and visual effects include principles related to the positioning and layout / siting and maximum design parameters of the onshore substations;
- **Design Principle 2**: architectural design strategy – an outline architectural strategy has been developed within the maximum design parameters, and a detailed architectural strategy will be developed by architects in collaboration with other technical and environmental disciplines post consent. The architectural design strategy includes consideration of layout, detailed form of buildings, lighting, and colour and material selection to mitigate adverse landscape and visual effects;
- **Design Principle 3**: an indicative landscape design plan for the onshore substation site is illustrated in **Volume 4, Outline Landscape and Architectural Strategy**. Onsite mitigation within the onshore substation zone is part of the Project's embedded mitigation. The indicative landscape design plan includes consideration of earthworks and security fencing / architectural fencing, and the planting of native species to create woodland, trees, hedges and other landscape features to mitigate adverse landscape and visual effects. A detailed landscape design plan will be developed by landscape architects in collaboration with other technical and environmental disciplines post consent; and
- **Design Principle 4**: 'Offsite' or potential further mitigation is proposed in response to residual, significant and adverse landscape and visual effects resulting from the size and scale of the onshore substations and is not part of the embedded mitigation. The location of the potential further mitigation is illustrated in **Volume 4, Outline Landscape and Architectural Strategy**. The potential further mitigation would seek to positively manage, create, reinforce / reinstate woodland and hedgerows within the area surrounding the onshore substations to increase screening and / or enhance landscape settings to better integrate the development within its landscape context.

4.2.1.7 The OLAS would be developed further post consent by landscape architects with the support of architects and ecological professionals, along with technical and engineering professionals to provide further detail for approval with Aberdeenshire Council. This process would secure continued detailed design evolution and improvements to the embedded environmental measures, maintaining or advancing the current standard of design and reviewing opportunities to optimise the design within the maximum design parameters.

4.3 Design evolution process

4.3.1.1 The design evolution process has involved engagement and consultation, providing opportunities for stakeholders to provide feedback and to understand and influence the design as it progresses. **Volume 1, Chapter 3: Site Selection and Alternatives** describes where engagement has informed site selection, consideration of alternatives or a change to the design. Stakeholder engagement and consultation will continue to develop following the submission of the Application through the detailed design process. Further detail on stakeholder engagement and the Pre-Application Consultation (PAC) is discussed in **Section 4.7**.

4.3.1.2 From the outset, environment considerations have been central to the Project's design. This is demonstrated through the development of the Commitments Register (**Volume 3, Appendix 5.2: Commitments Register**), which was initially presented in the Scoping Report (MarramWind Limited, 2023), updated following the Statutory Consultation, and has further refined at the EIA Report stage as the design evolved and more information became available.

4.3.1.3 At each stage in the evolution of the Project, the following activities, where appropriate were undertaken to consider alternatives and to refine the design. This included the following activities, where appropriate:

- updating of constraints mapping as new environmental information became available;
- analysis of information collection from EIA surveys;
- identification of technical construction challenges and engineering considerations;
- collaborative working with technical environmental specialists and engineers;
- detailed review of land ownership;
- engagement with stakeholders including other offshore wind developers and landowners; and
- considering feedback from Statutory Consultation.

4.3.1.4 With this approach to design, the Applicant is seeking to achieve a sustainable and environmentally appropriate design for the Project, one that will meet operational requirements at the same time as limiting and mitigating the environmental effects of the Project as far as practicable.

4.4 Mitigation hierarchy

4.4.1.1 The mitigation hierarchy (including identification of environmental mitigation measures) is a fundamental principle in design evolution that indicates the order in which the impacts of a development should be considered and addressed. The EIA Regulations define the mitigation hierarchy as follows:

- avoid;
- prevent;
- reduce; and
- offset.

4.4.1.2 The Institute of Environmental Management and Assessment, Implementing the Mitigation Hierarchy from Concept to Construction (2024) states that the mitigation hierarchy is "*A systematic approach used to minimise adverse effects of a project or scheme on the environment and people. It is a series of steps or principles to guide decision-making and prioritise activity. The hierarchy comprises four stages, with the most desirable first: avoid, prevent, reduce and, finally, offset. The hierarchy indicates that avoidance is the priority and offsetting should only be relied on as a last resort*."

4.4.1.3 Robust application of the mitigation hierarchy has been followed throughout the site selection and design iteration process and also applied more widely on the Project.

4.4.1.4 The iterative design process has integrated the advice and expertise of environmental specialists who conducted the analyses informing this EIA Report, alongside regular collaboration with the Project's design teams. This has ensured that the design evolution reflects a comprehensive understanding of environmental sensitivities and that the mitigation hierarchy has been consistently applied.

4.5 Assurance of design decisions

4.5.1.1 Throughout the design evolution process, a number of design decisions have been made in response to the environmental constraints and technical challenges identified during the optioneering and EIA process and through stakeholder feedback. These have been progressed through discussion and interaction between the Applicant's development and engineering teams, as well as relevant environmental teams prior to the final design envelope being agreed for inclusion in the consent applications.

4.5.1.2 All design decisions have been made via a rigorous assurance process to agree and commit to the design decisions being made via a Technical Committee, Development Committee and a Board of Directors. Design decisions have been made from a well-informed position with a holistic consideration of all Project design principles, the mitigation hierarchy, and stakeholder views.

4.6 Environmental, commercial and technical considerations

4.6.1.1 Environmental, commercial and technical constraints were considered in the onshore Project's design process. These were initially identified through the EIA Scoping and also through desk-based studies, surveys and consultation with stakeholders. As part of the Project design process, a number of embedded environmental measures have been adopted to reduce the potential for environmental impacts and effects. These embedded environmental measures have evolved over the design development process and in response to consultation. They have fed iteratively into the EIA.

4.6.1.2 Environmental, commercial and technical constraints considered are summarised in **Table 4.1**.

Table 4.1 Constraints considered for onshore infrastructure selection

Constraint category	Constraint
Bathymetry and morphology	• distance to 10m water depth contour; • seabed mobility; • coastal erosion; • coastal management; and • metocean.
Geology and geotechnics	• nearshore burial characteristics.
Seabed obstructions	• oil and gas infrastructure; • chartered wrecks and obstructions; • cables; • disposal sites; and • anchorages.
Unexploded ordnance (UXO)	• risk of UXO.
Nature conservation	• designated sites; • important habitats and species; • seal haul-out sites; and • fish nursery and spawning grounds.

Constraint category	Constraint
Residential and community	• residential properties; • community facilities; • planning policy and applications; • public access; and • amenity and recreation.
Ground conditions	• landfills; • contaminated land; • agricultural land; • geodiversity; • soils and peat; and • minerals.
Water environment	• WFD surface water bodies; • potable use; and • flood risk.
Landscape and visual	• landscape elements and characterisation; • landscape designations; and • proximity to nearest residential properties, transport and recreational routes, tourist destinations.
Historic environment	• listed buildings; • scheduled monuments; • inventory battlefields; • inventory gardens; • properties in care of Scottish Ministers; • world heritage sites; • areas of archaeological potential; • designated wrecks; • protected military remains; and • important palaeo-landscapes.
Commercial	• inshore fishing activity; • static fishing activity; • commercial fisheries activity; • shipping interests; • aquaculture sites; • shellfish protected areas; • harbour limits; and • land ownership.
Construction	• space required for construction; • change in elevation / slopes; • geohazards; • access; • utilities; and • overhead lines.

4.7 Stakeholder engagement and pre-application consultation

4.7.1.1 Central to the development of the Project and the delivery of the EIA has been stakeholder engagement and the delivery of Statutory Consultation. A range of stakeholders have been provided with opportunities to share feedback and input into the design of the Project, refinement of the EIA, and assisting in the development of any required mitigation measures. Stakeholders have included Statutory consultees, environmental organisations, government bodies, politicians, local communities and community organisations, businesses and landowners.

4.7.1.2 Since early 2022, the Project has proactively involved stakeholders from the early stages of development to ensure those with an interest have been able to share their views, make suggestions and input into the development process. Further information can be found in the MarramWind Onshore PAC Report which supports the determination of the Application for the Project.

4.8 Project (onshore) design and consideration of alternatives

4.8.1 Overview

4.8.1.1 This Section details the Project's (onshore) design evolution and consideration of alternatives for the landfall(s), onshore substations and onshore export cable corridor.

4.8.2 Landfall(s) site - selection

4.8.2.1 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.

4.8.2.2 Landfall optioneering commenced prior to the publication of the results of the National Energy System Operator (NESO) Holistic Network Design (HND) process in July 2022 (NESO, 2022), at a time when the Project held a grid connection agreement for a 3GW grid connection at New Deer, which was expected to be superseded on confirmation of the expected grid connection at Peterhead.

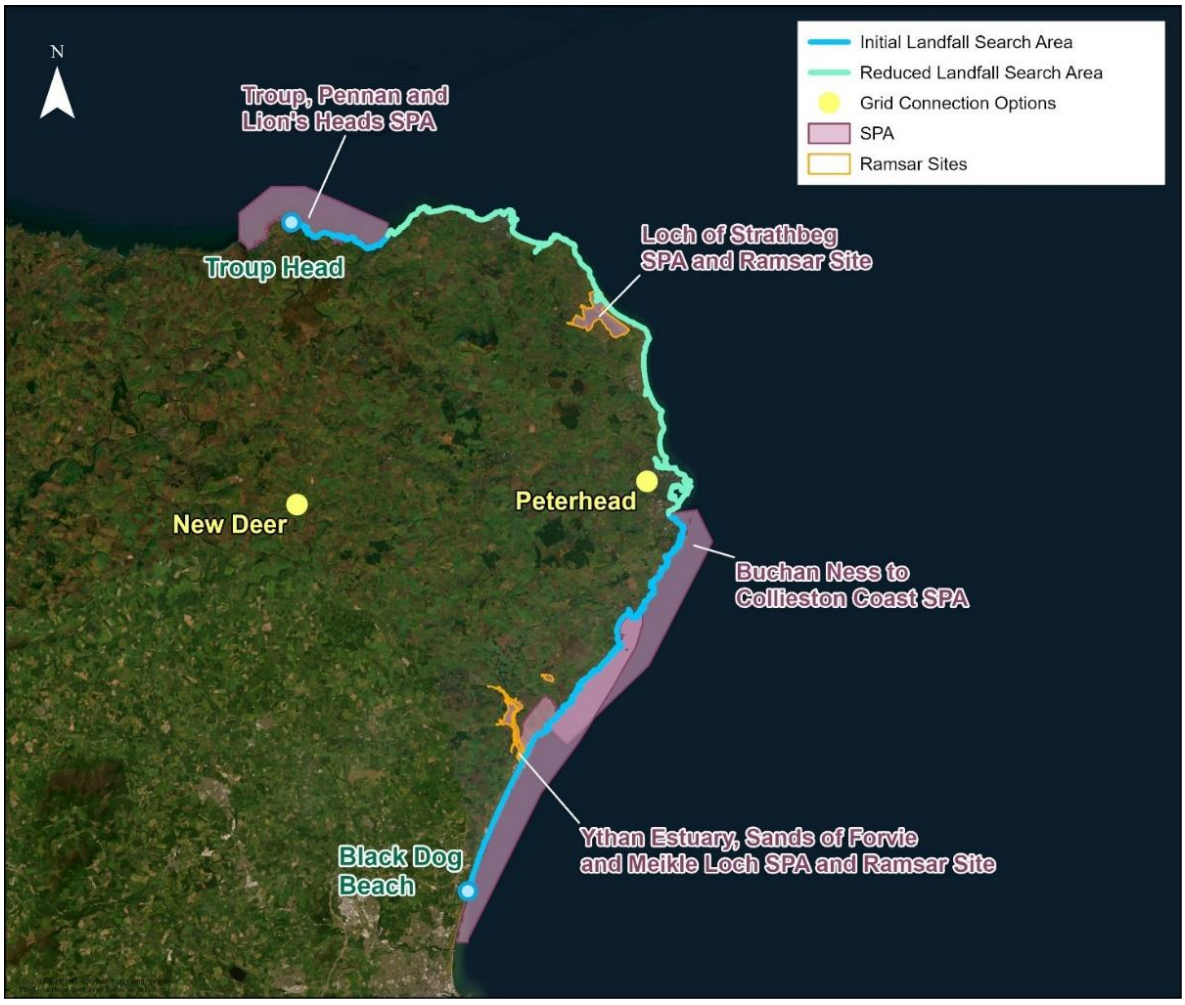
4.8.2.3 The landfall site identification process was therefore initially undertaken on the basis that solutions would need to be appropriate for either a grid connection point at New Deer or a connection in the vicinity of Peterhead.

4.8.2.4 A landfall search area was developed accordingly, reaching from Troup Head in the north to Black Dog Beach, north of Aberdeen, in the south. This search area encompassed a total of 70km of coastline centred around a grid connection point in the vicinity of Peterhead.

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

4.8.2.6 The extents of the search area were then refined to avoid the Troup, Pennan and Lion's Head Special Protected 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, which stretches 44km along the east-facing coast to the north of Black Dog Beach, see **Plate 4.1.**

Plate 4.1 Landfall search area



4.8.2.7 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), which provided the coastal extents of the Scoping Boundary.

4.8.2.8 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.

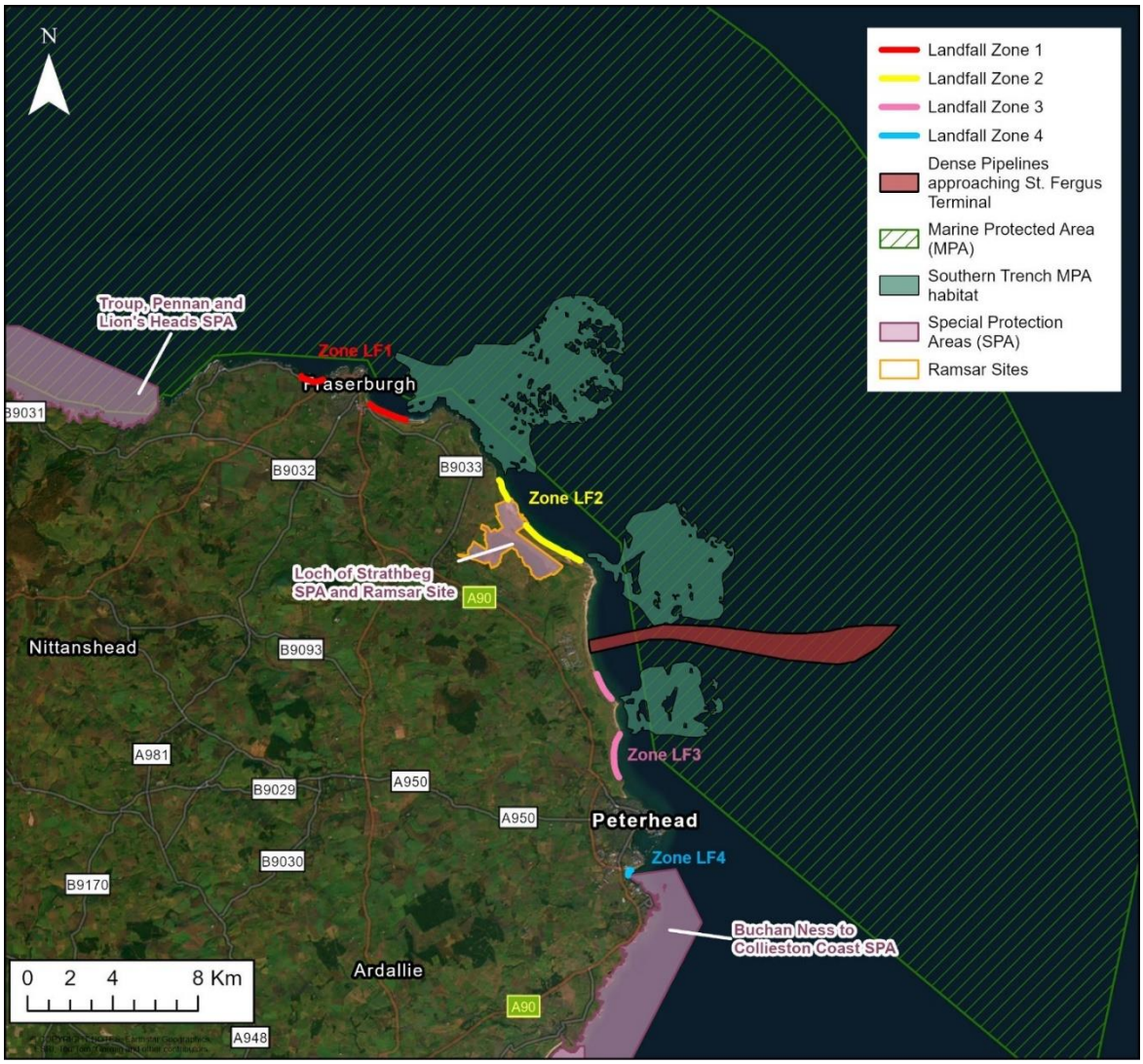
4.8.2.9 On publication of NESO's HND Report (NESO 2022) and the subsequent Beyond 2030 Report (NESO, 2024), which collectively confirmed the Project's 3GW connection at the planned SSEN Netherton Hub to the west of Peterhead, the requirement to maintain options (including landfall options) to facilitate a connection to New Deer was no longer applicable. Landfall site selection therefore focused on options that were preferable for connections to Peterhead, and more specifically, SSEN Netherton Hub.

4.8.2.10 Consideration of key constraints within the landfall(s) search area was undertaken 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.

4.8.2.11 The proposed landfall Zones LF1-4 are illustrated in **Plate 4.2** below.

Plate 4.2 Landfall zones



4.8.2.12 An appraisal of the relative favourability 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 (a) 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 (b) they offered substantially shorter onshore export cable corridors to SSEN Netherton Hub, reducing potential interaction with sensitive features in the onshore environment.

4.8.2.13 Zone LF3 was considered the most favourable location for landfall siting to serve a SSEN Netherton Hub connection, and Zone LF4 had a number of potential advantages to this same end, dependent on investigation of the amount of space available for the landfall infrastructure and associated onshore export cable corridors in both the nearshore area and onshore. Zones LF1 and LF2 were discounted from further consideration, in favour of zones LF3 and LF4.

4.8.2.14 The next step taken was to identify and compare potential landfall(s) site options within the two zones retained for consideration.

4.8.2.15 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.

4.8.2.16 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).

4.8.2.17 These three options were included within the Project boundary presented at Statutory Consultation Round 1, see **Plate 4.3** below which illustrates the three-remaining landfall(s) options.

Plate 4.3 Landfall Zone LF3 and landfall Zone LF4 site options

4.8.2.18 Following the consultation, 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.

4.8.2.19 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 3 (with National Grid), led to the conclusion that, following installation of the EGL projects, the remaining space would only be sufficient for one or two cables to land. Since the maximum project envelope was up to seven cables, this rendered Sandford Bay unsuitable even as an 'overflow' option.

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

4.8.2.21 Scotstown was also considered, on assessment, to be a partial solution, because the presence of pipelines approaching the St. Fergus Gas Terminal limits the number of offshore cables that can be routed through the nearshore area.

4.8.2.22 Whilst it is preferable for the Project to use a single 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.

4.8.2.23 A distinction has been drawn between the north and south parts of the Lunderton landfall area with the division aligning with a local (unnamed) ditch / watercourse emerging on the coastline at the northern extent of the Craigewan Links Golf Course. A landfall at Lunderton south would need to cross the golf course site (via a trenchless installation method).

4.8.3 Landfall(s) - design

4.8.3.1 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 wind turbine generators (WTGs).

4.8.3.2 The key works for landfall(s) construction above and below MHWS are listed below.

4.8.3.3 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.

4.8.3.4 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.

4.8.3.5 To reduce the environmental impact of the landfall, a trenchless solution is to be implemented to install ducts. Whilst other trenchless methods are available, HDD (or similar trenchless technique) is presented herein as it is likely to have the largest construction footprint. 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.

4.8.3.6 The proposed indicative design envelope for key characteristics of the Project landfall(s) are summarised in **Table 4.2.**

Table 4.2 Landfall(s) parameters

Parameters	Indicative design envelope
Landfall(s) location	Up to three
Number of HDD (or similar trenchless technique) cable ducts	Up to eight (including one spare duct / bore)
Number of transition joint bays	Up to seven
Transition joint bay: width, length and depth	3.5(m x 12m x 2.5m
Link box: width, length and depth	1m x 3m x 1.5m
FOC junction box: width, length and depth	1m x 3m x 1.5m
Landfall(s) temporary construction compound: length and width	Up to 345m x 70m (combined area for all three phases).

4.8.4 Onshore substation site - selection

4.8.4.1 There are significant technical advantages to be gained by locating the Project onshore substations close to the grid connection point, in that the need for certain types of conversion/transformation equipment may be required or reduced, and electrical losses may be minimised. A distance of three km was established as a target maximum separation between the two points to enhance system reliability and ensure safe electricity transmission to the national grid.

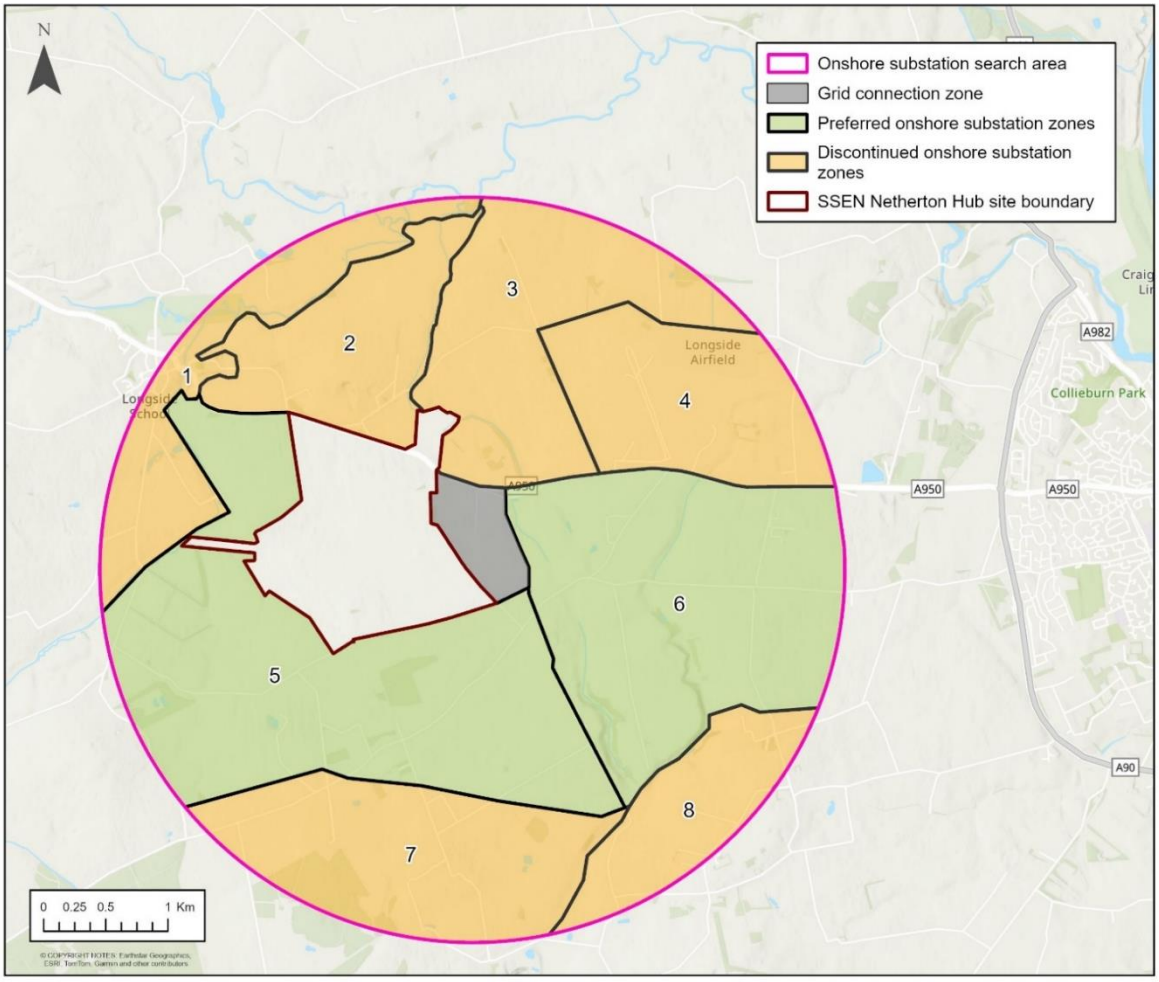
4.8.4.2 The Applicant commenced the onshore substation site selection process in early 2022, prior to the publication of NESO's HND Report (NESO, 2022) and the subsequent Beyond 2030 Report (NESO, 2024). At this time, the Project held a grid connection agreement for a three-

gigawatt (GW) grid connection at New Deer, which was expected to be superseded on confirmation of the expected grid connection at Peterhead. Preliminary work focused on establishing a robust and comprehensive set of selection / assessment criteria specific to the onshore substations in alignment with the Horlock Rules (National Grid, 2009).

4.8.4.3 On confirmation of the grid connection location, a targeted search area was established for onshore substation site options, set to a circle of 3km radius around the SSEN Netherton Hub.

4.8.4.4 The search area was divided into eight zones, each an area with approximately uniform characteristics in terms of risks and opportunities for onshore substation site construction, for screening purposes, see **Plate 4.4** which illustrates the onshore substations search area and zones.

Plate 4.4 Onshore substations search area and zones



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

4.8.4.6 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).

4.8.4.7 A comparative assessment of the five site options was carried out, taking into consideration feedback from Statutory Consultation 1, with the conclusion that the easternmost sites (denoted site Options B and C) offered the greatest advantages. Site Option B lies approximately equidistant between the SSEN Netherton Hub and the western extent of Peterhead, directly south of the A950. Site Option C lies south-southeast of Option B, close to Hillhead of Cocklaw. Site Options B and C were presented at Statutory Consultation 2.

4.8.4.8 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. Additionally, the central part of site Option C is covered by a large area of peaty gleys, which could potentially complicate construction and require some environmental mitigation due to the potential presence of carbon rich soils (as protected by National Planning Policy Framework NPF4 (Scottish Government, 2023)).

4.8.4.9 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 where it acts as a ring road around Peterhead, minimising distances and durations for Project traffic from the trunk road.

4.8.4.10 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.

4.8.4.11 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. The Onshore Red Line Boundary was set at the full extent of the land parcel containing site Option B. Those parts of the land parcel not directly used for the onshore substations and access roads may be used for planting / screening, landscaping and drainage systems.

4.8.4.12 **Plate 4.5** illustrates the onshore substation site options during Statutory Consultation 1 and **Plate 4.6** illustrates site Option B which was taken forwards for the establishment of the Onshore Red Line Boundary.

Plate 4.5 Onshore substation site options at Statutory Consultation 1

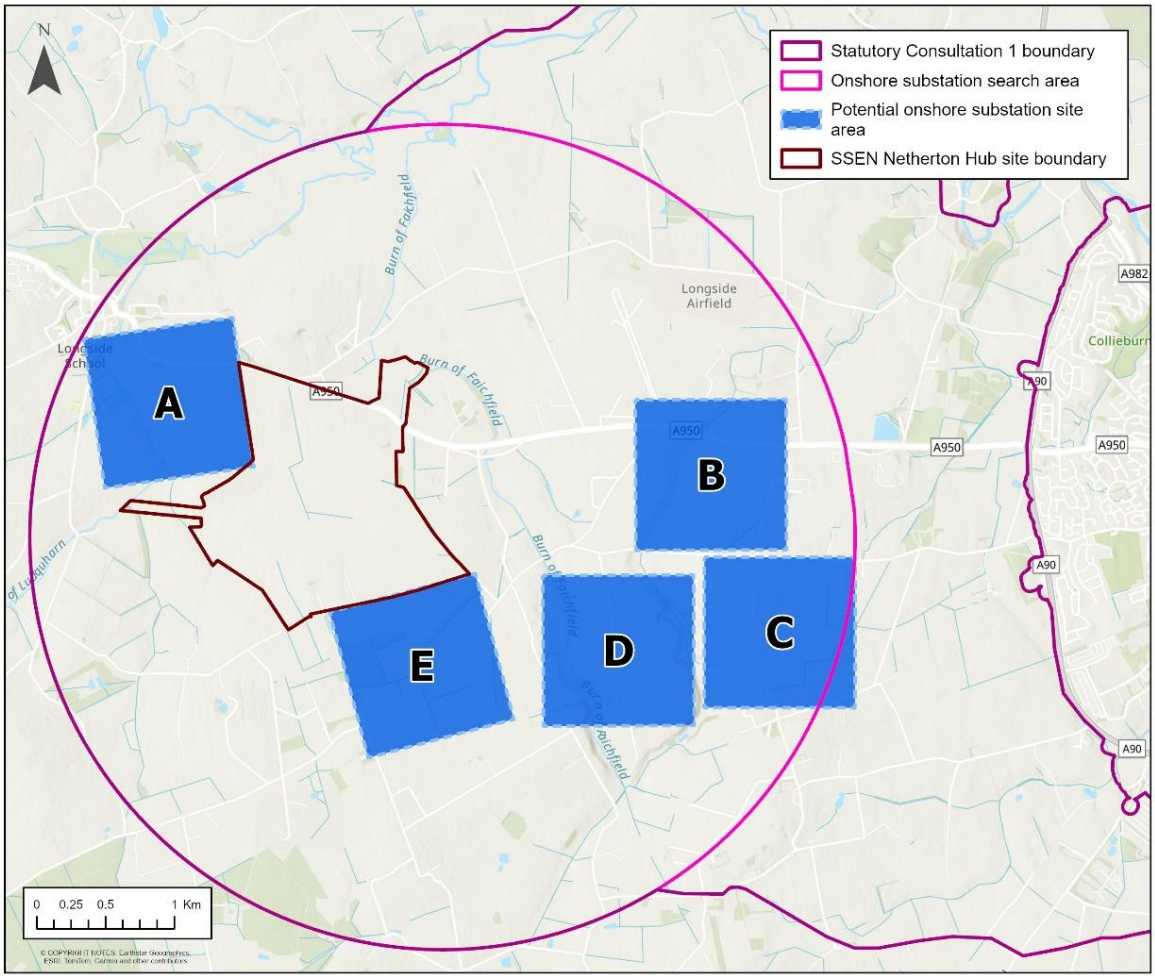
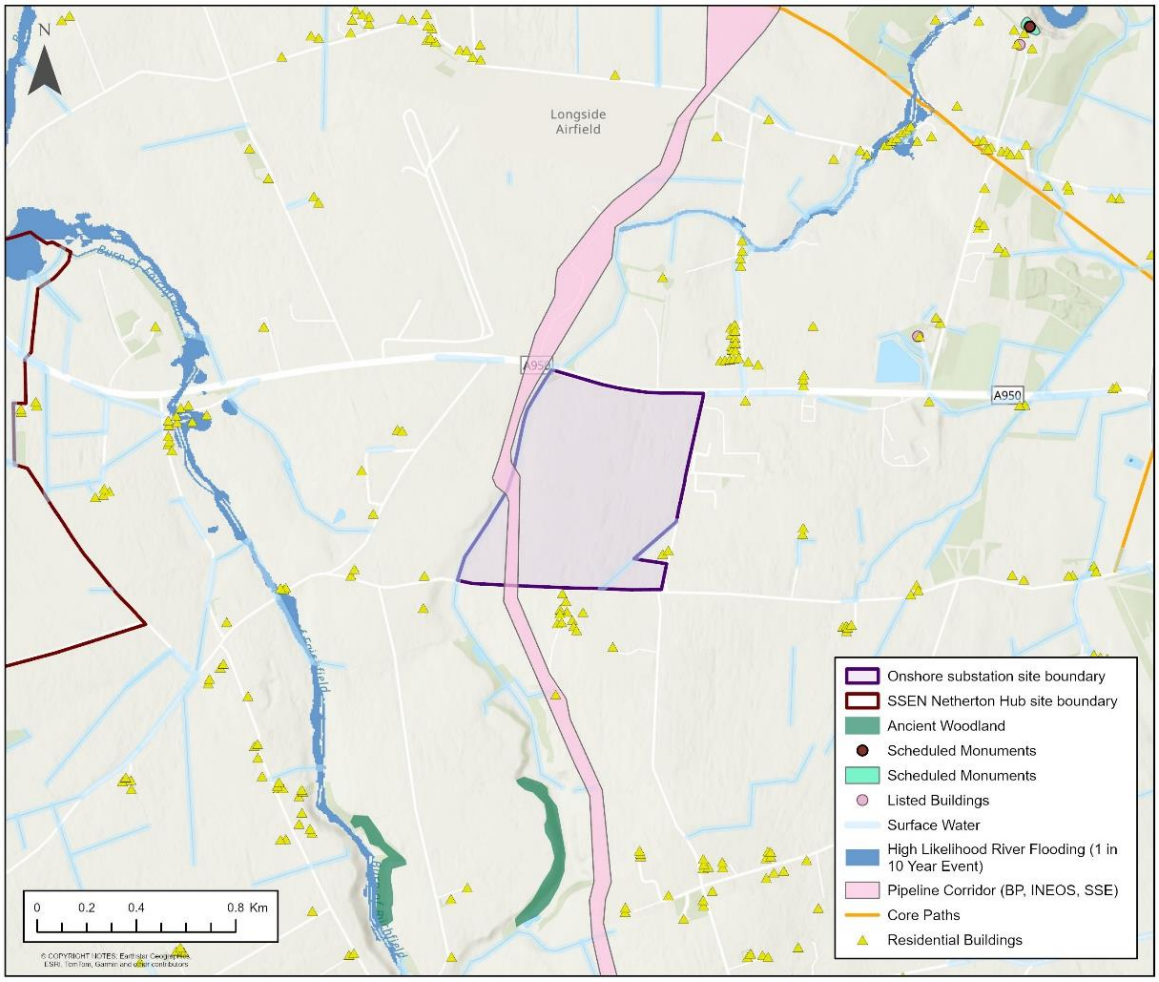


Plate 4.6 Site Option B



4.8.5 Onshore substations - design

4.8.5.1 Three onshore substations will be co-located within the onshore substation site, one for each Project phase. 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 400 kilovolt (kV) required to connect to the proposed SSEN Netherton Hub and to house the high voltage direct current (HVDC) and high voltage alternating current (HVAC) electrical components required to ensure the offshore wind farm export power is compliant with UK Grid Code (NESO, 2023) at the time of connection. The onshore export cables will be routed to each of the onshore substations and from the onshore substations to the point of connection at SSEN Netherton Hub.

4.8.5.2 **Appendix A, Figure 1** identifies the location of the onshore substation site and the indicative location of the three onshore substations which is based on maximum permanent footprint and two site access roads to enable access to each of three onshore substations. The three onshore substations will be built sequentially to align with the phased energisation of the WTGs. Further information on the indicative construction programme for the construction of the onshore substations is provided in **Section 4.8.1**.

4.8.5.3 The maximum permanent footprint of the onshore substations will be, collectively, up to 15 hectares (ha) 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, as shown for the onshore substations in **Volume 4: Outline Landscape and Architectural Strategy**.

4.8.5.4 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, incorporating sufficient mitigation to meet the necessary noise limits. The onshore substations include the following buildings, electrical components and equipment (subject to detailed electrical design):

- STATCOM hall;
- STATCOM transformers;
- super grid transformers (i.e. 400 / 275kV, 400 / 320 kV, 400 / 525kV);
- 275 and 400kV GIS hall;
- 275kV GIS hall;
- 400kV GIS hall;
- control room;
- 275kV HF
- 275kV SHR (for HF)
- 400kV HF;
- 400kV SHR (for HF);
- HVDC Converter hall;
- power line carrier Filter, AC Switchgear and HF building;
- spare parts building; and
- car parking.

4.8.5.5 Whether the onshore substations electrical components and equipment are fully housed in buildings, or this equipment is partially placed outdoors, the three onshore substations will be subject to the maximum design parameters presented in **Table 4.3**.

Table 4.3 Indicative onshore substation parameters

Parameters	Indicative design envelope – fully enclosed onshore substations	Indicative design envelope – partially enclosed onshore substations
Permanent combined onshore substation site footprint	Up to 15ha	
Typical onshore substation foundation depth	600 millimetres (mm)	
Permanent access roads	Approximately 700m in length and 6m wide	

Parameters	Indicative design envelope – fully enclosed onshore substations	Indicative design envelope – partially enclosed onshore substations
Temporary construction compound	Up to 3.06ha	
Maximum building height for HVAC electrical infrastructure	Up to 17.5m	
Maximum building height for HVDC electrical infrastructure	Up to 30m	
Maximum number of buildings	Up to 35	Up to 12
Maximum building length	Up to 104m	Up to 91m
Maximum building width	Up to 88m	Up to 88m
Maximum height of external electrical infrastructure for HVAC	N/A	Up to 12m
Maximum height of external electrical infrastructure for HVDC	N/A	Up to 16.6m
Lightning protection mast height	Up to 32m	
Duration of construction	• onshore substation 1 – up to three years; • onshore substation 2 – up to three years; and • onshore substation 3 – up to three years.	

4.8.6 Onshore export cable corridor - site selection

4.8.6.1 The onshore export cable corridor is also generally responsive to the preferred locations for the landfall(s) and onshore substations. Although the landfall(s) or onshore substations option may be evaluated poorly on the grounds that it is difficult to establish onshore export cable corridor access, it is more commonly the case that the onshore export cable corridor will connect the preferred onshore substations and landfall(s) rather than drive their selection.

4.8.6.2 This being the case, it was necessary at the Scoping stage (prior to the publication of the HND and Beyond 2030 Reports) to define a Scoping Boundary that allowed adequate coverage for onshore export cable routing between (a) New Deer and the identified landfall zones and (b) all reasonable areas which might become the site of SSEN Netherton Hub and the identified landfall(s).

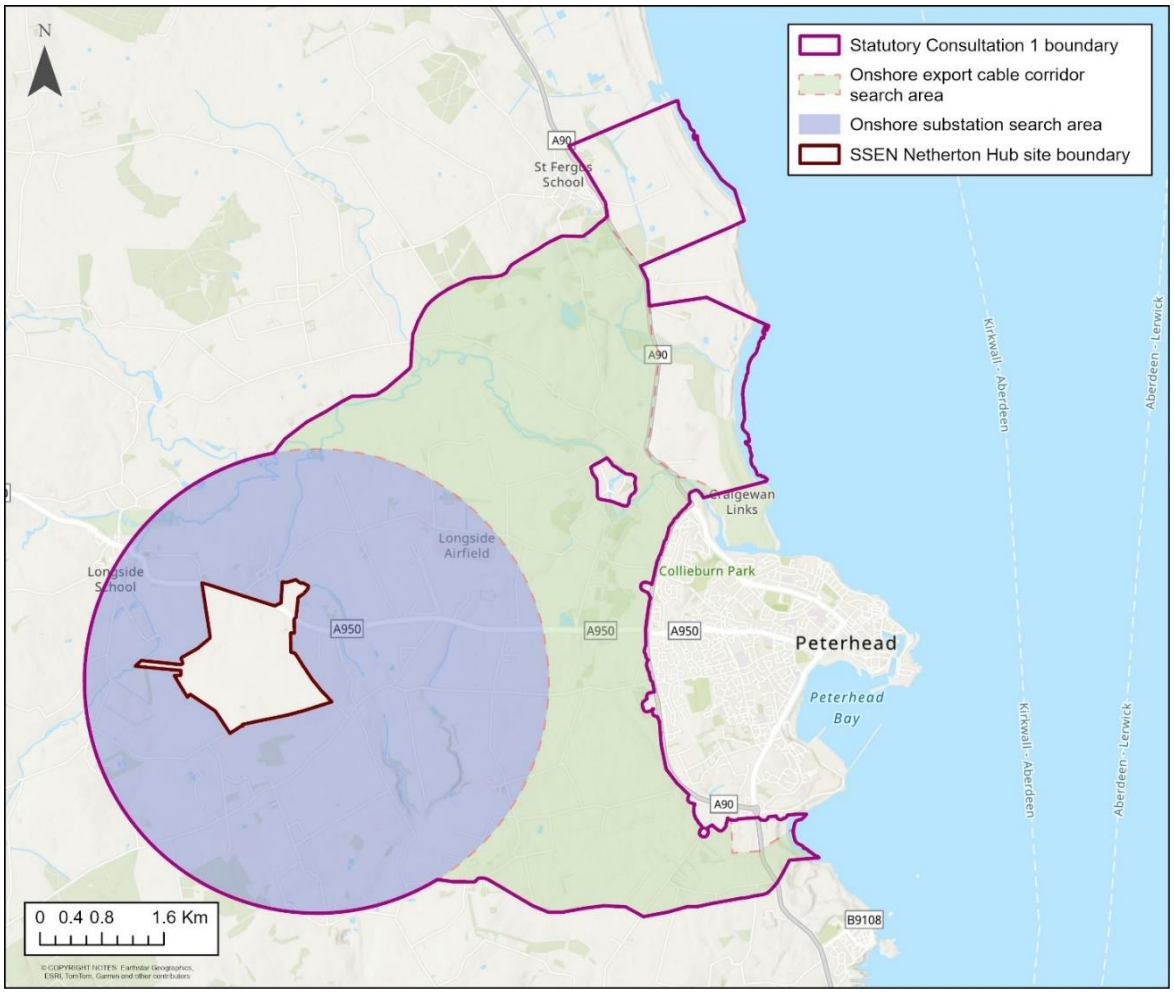
4.8.6.3 Environmental, commercial and technical constraints were also identified and mapped early in the selection process, in order to provide a consistent framework for assessment.

4.8.6.4 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.

4.8.6.5 To respond to the multiplicity of site (landfall(s) and onshore substations) options to be connected by the onshore export cable corridor, a preliminary network of links was created to explore the optimum routes that might serve any combination. This was achieved by the creation of a heat map of risks and constraints reflecting the onshore export cable corridor assessment criteria. A Geographic Information System (GIS) platform was used to autogenerate paths with minimal interaction with mapped constraints. The resultant network was then reviewed and adjusted as necessary to ensure that it was robust from a construction perspective.

4.8.6.6 The Statutory Consultation 1 boundary was set to include all paths in the onshore export cable corridor network (with a reasonable buffer applied). The onshore substations search area extent was also included, to allow for flexibility in accessing any of the onshore substation site options under consideration, and the landfall(s) under consideration were also included in full, see **Plate 4.7** below which illustrates the Statutory Consultation 1 boundary.

Plate 4.7 Statutory Consultation 1 boundary



4.8.6.7 Feedback from Statutory Consultation 1 and further review of environmental and technical constraints supported the further down selection of onshore substation site options to the extent that only two (options B and C) were carried forward for inclusion in the more refined boundary prepared for Statutory Consultation 2. Additionally, the decision was taken at selection stage 3 to discount Sandford Bay (Landfall Zone LF4) from further consideration.

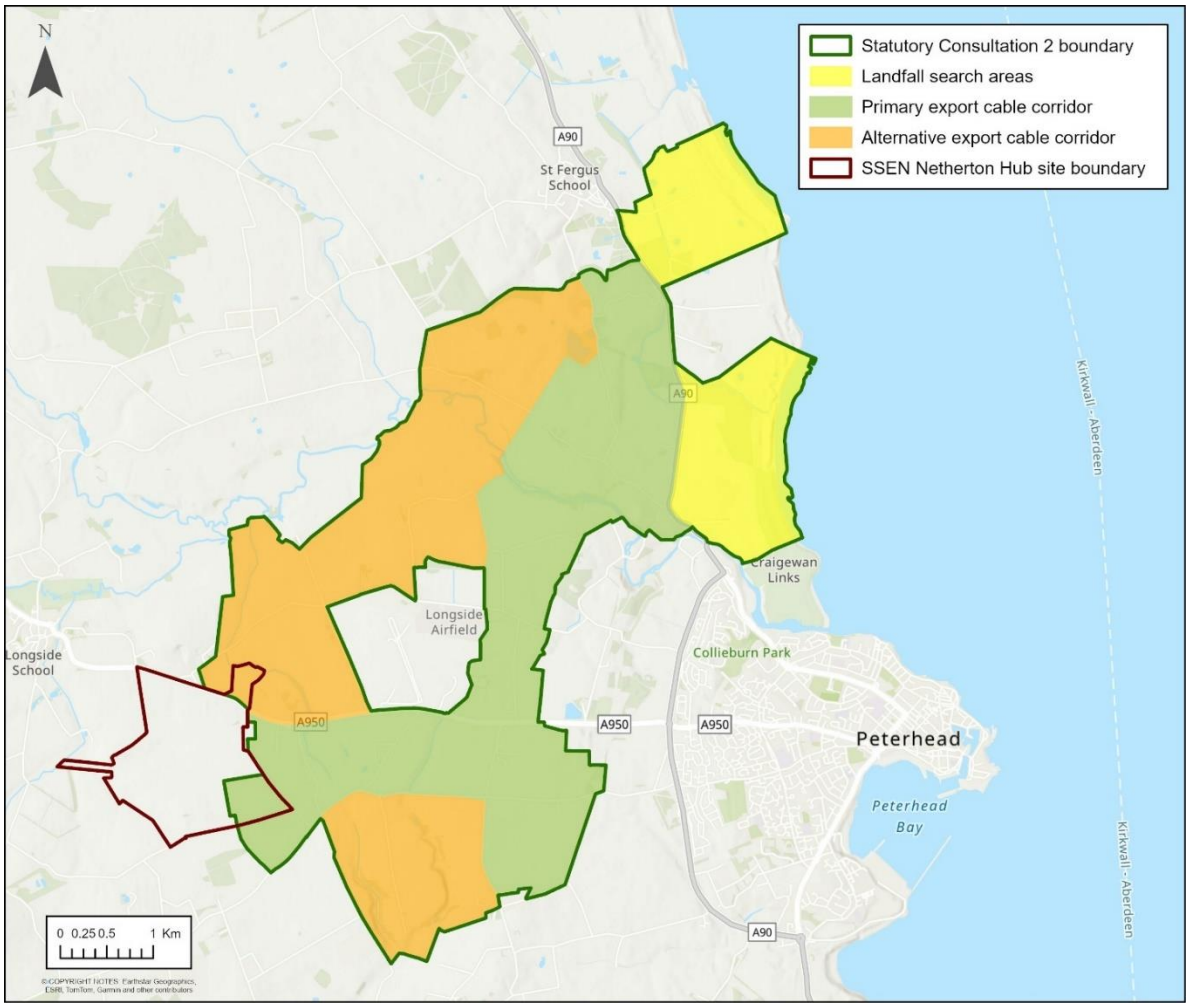
4.8.6.8 The reduction of landfall(s) and onshore substation site options simplified the onshore export cable corridor network. Paths from Sandford Bay became redundant, as did any links accessing SSEN Netherton Hub from the north, west and (largely) south.

4.8.6.9 Further assessment and refinement of the potential 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.

4.8.6.10 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.

4.8.6.11 Consequently, although the western route was considered viable, the eastern route was preferred and was therefore presented as the 'primary' route at Statutory Consultation Round 2 (the western route being labelled 'alternative'), see **Plate 4.8** below which illustrates the Statutory Consultation 2 boundary.

Plate 4.8 Statutory Consultation 2 boundary



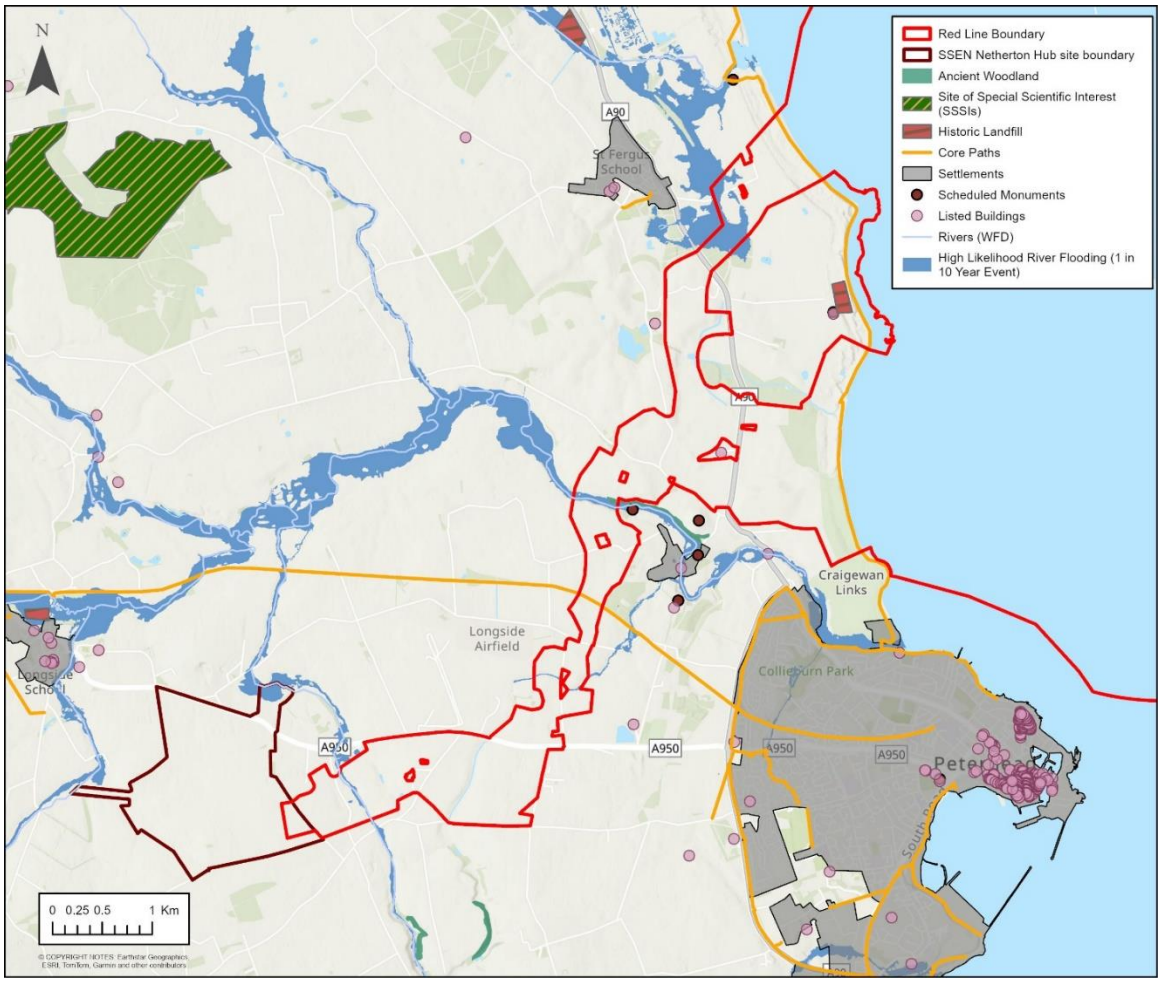
4.8.6.12 Responses received at Statutory Consultation 2 relating to the onshore infrastructure indicated that the key development considerations to consultees were traffic and transport and landscape and visual.

4.8.6.13 These consultee priorities supported the (already established) 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.

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

4.8.6.15 The extent of the primary onshore export cable corridor was also refined significantly 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 4.9** below.

Plate 4.9 Onshore export cable corridor Onshore Red Line Boundary



4.8.7 Onshore export cable corridor - design

4.8.7.1 The onshore export cable corridor will include the underground export cables to be installed between the landfall(s) and the three onshore substations co-located at the onshore substation site, and from the onshore substations to the point of connection at SSEN Netherton Hub (see **Appendix A, Figure 1**). The onshore export cables will be installed in three phases to align with the energisation of the WTGs.

4.8.7.2 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. The joint bays (JBs), 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.

4.8.7.3 In the event that more than one landfall is required, the connecting onshore export cables, from the common onshore export cable corridor to the additional landfall(s), may be laid in trenches or installed in ducts to align with the phased installation of the landfalls.

4.8.7.4 The proposed indicative design envelope for key parameters of the onshore export cable corridor is summarised in **Table 4.4**.

Table 4.4 Indicative onshore export cable corridor parameters

Parameters	Onshore export cable corridor from the landfall(s) to the onshore substations	Onshore export cable corridor from the onshore substations to SSEN Netherton Hub
Voltage	275kV – 400kV (HVAC) ±320kV – ±525kV (HVDC)	400kV
Number of cable circuits	Up to five	Up to seven
Number of onshore export cables	Up to 19 onshore export cables - based on four HVAC circuits (each with 3 power cores and one FOC and one HVDC circuit (two power cores and one FOC)).	Up to 28 onshore export cables - based on up to three power cables in each circuit (plus one FOC for each circuit).
Maximum number of trenches	Up to six	Up to seven
Typical trench width: at base	Up to 1m	
Typical trench width: at surface	Up to 4m dependant on soil strength. Maximum angle of trench dependant on soil strength.	
Typical trench depth	Up to 1.5m, dependent on ground conditions.	
Typical depth to top of buried infrastructure (ducts)	0.9m to 1.2m	
Number of ducts (including fibre optics)	Up to 19	Up to 28
Corridor width: permanent (servitude)	Up to 61m	Up to 71m
Corridor width: temporary construction corridor width	Up to 89m	Up to 99m
Onshore export cable corridor length	11.0km	2.35km
No. of expected trenchless crossings (as per **Volume 3, Appendix 4.1 Crossing Register**)	Nine	Two

5. Access Considerations

5.1 Introduction

5.1.1.1 As part of this EIA Report, a Traffic and Transport Assessment has been undertaken, see **Volume 1, Chapter 26: Traffic and Transport** along with the following documents:

- **Volume 2, Figure 26.1: Transport Study Area;**
- **Volume 3, Appendix 26.1: Transport Assessment**;
- **Volume 3, Appendix 26.2: Abnormal Load Route Assessment;**
  - **Volume 3, Appendix 26.2, Figure 2: Cable Drum Delivery Route;**
- **Volume 4, Outline Construction Traffic Management Plan;**
  - **Volume 4, Outline Construction Traffic Management Plan, Figure 1: Proposed Access Routes;**
  - **Volume 4, Outline Construction Traffic Management Plan, Figure 2: Potential Diversion Routes;**
  - **Volume 4, Outline Construction Traffic Management Plan, Appendix A: Outline Travel Plan;**
  - **Volume 4, Outline Construction Traffic Management Plan, Appendix B: Outline Core Path Management Plan**; and
- **Volume 4, Outline Construction Environmental Management Plan.**

5.1.1.2 The Project will require a number of access routes throughout both the construction and O&M stages. The following sections outline the current road network and the proposed construction and O&M access considerations as identified in **Volume 1, Chapter 26: Traffic and Transport** which has been submitted as part of the Application.

5.1.2 Road network

5.1.2.1 **Volume 2, Figure 26.1** details the 'A', 'B', 'C', and unclassified roads that could be directly impacted by the Project and included as part of the traffic and transport assessment.

Trunk road network

5.1.2.2 The A90 is the principal trunk road, providing north-south connectivity and serving as the main access route for construction traffic. It features both single and dual carriageway sections, with varying speed limits and levels of pedestrian infrastructure. The road runs from Fraserburgh to Edinburgh passing through Aberdeen and Dundee and is dual carriageway from Aberdeen to Edinburgh.

Local road network

5.1.2.3 The local road network comprises of the following A, B and C and unclassified roads:

- the A950, B9178, and a series of C-class and unclassified roads provide east-west and local access, supporting both project-related and general traffic;

- the A950 two lane single carriageway road forms an east west link through the study network, linking Peterhead town centre to the A98;
- the B9178 two lane single carriageway road forms an east west link from Peterhead port to the A90(T);
- the C5B is a two-lane single carriageway road (no centre line marking) running east west through the study network, linking the A90(T) to the A952 just north of Mintlaw;
- the C43B is predominantly a single carriageway road running south north through Inverugie located within the study network. This road forms a link between the C5B at A90(T) and Longside Airfield to the southwest;
- the U32B is a single carriageway road running east west through the study network connecting St Fergus to Scotstown Beach;
- the U45B is a single carriageway road running east west through the Easterton and Ravenscraig settlements within the study network, connecting Inverugie with Longside Airfield;
- the U50B is a single carriageway road running north south through the Blackhills settlement within the study network, connecting the C43B with the A950;
- the U59B is a single carriageway road running north south through Howemuir within the study network, connecting the C38B with the A950; and
- the U63B is a two-lane single carriageway road (with centre line marking) running north south through the study network.

5.1.3 Pedestrian, core path and cyclist facilities

Pedestrian facilities

5.1.3.1 The Onshore Red Line Boundary passes through an area which is predominantly rural in nature, with limited pedestrian facilities provided outwith towns and villages. There are pedestrian facilities provided by way of footways adjacent to carriageway on a few sections of the access routes, predominantly along the A90 adjacent to Peterhead.

Core paths

5.1.3.2 A review of the core path network within Aberdeenshire indicates that the following core paths are located within or intersect with the Onshore Red Line Boundary or study network as shown in **Plate 5.1**.

- 7LD.01.18 – Coastal Path: Old Rattray to Peterhead;
- 217.01 – St Fergus: Scotstown Head Path;
- L30R – St Fergus: Scotstown Head road link;
- 7LD.03MP.05 – The Formartine and Buchan Way: Longside to Peterhead;
- 7LD.03MP.06 – The Formartine and Buchan Way: Peterhead;
- 215.11 / 215.02 – Peterhead: A90(T);
- 215.04 – Peterhead: Boddam; and
- 7LD.01.22P / 7LD.01.24 – Coastal Path: Peterhead Prison.

Plate 5.1 Core path network

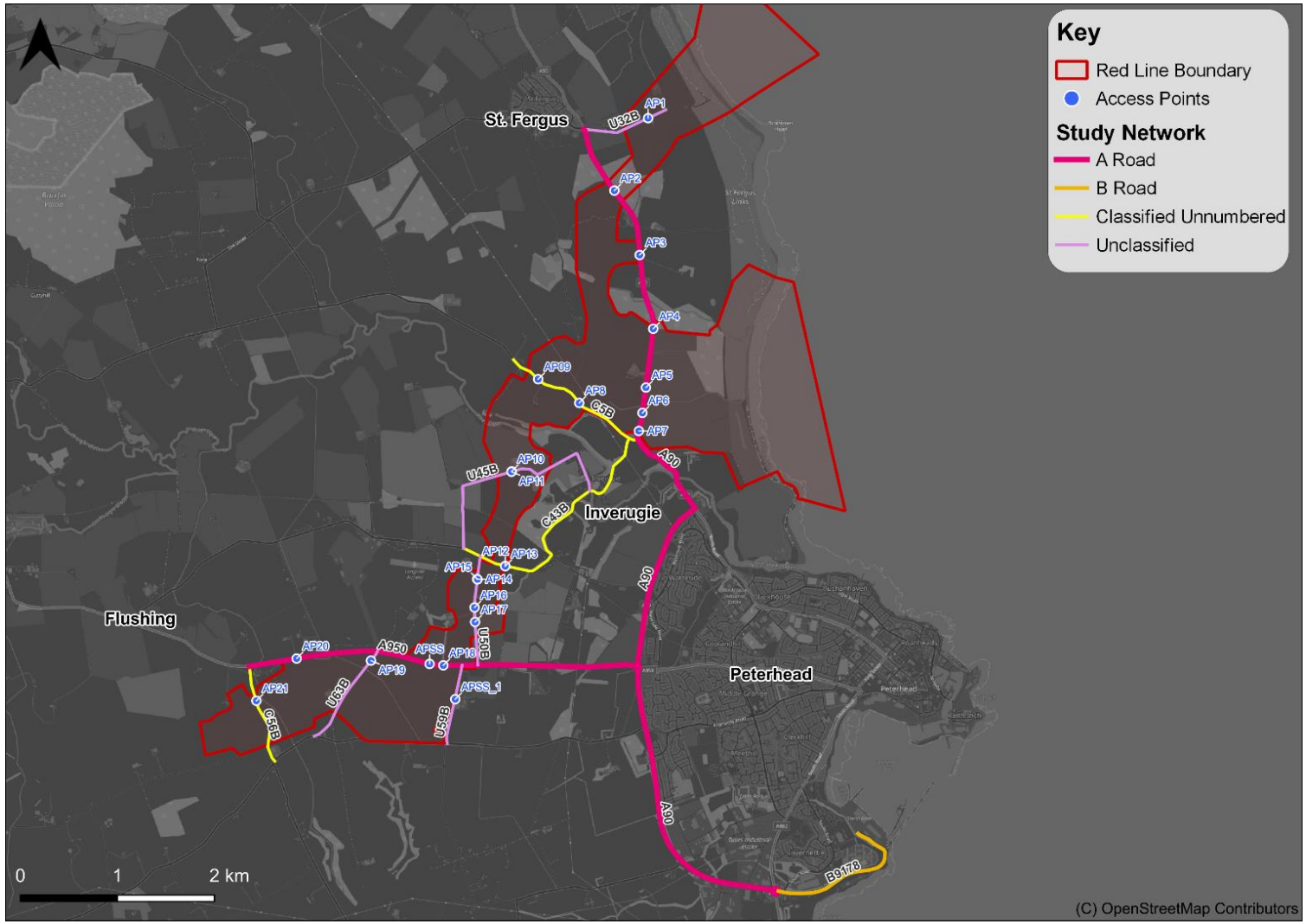
Cycle facilities

5.1.3.3 There are limited cycle facilities in the vicinity of the Onshore Red Line Boundary, however, the Formartine and Buchan Way, which forms part of Aberdeenshire's core path network, is a long-distance off-road trail that links Dyce with Peterhead and Fraserburgh. The route crosses the study network south of Inverugie at the C43B and U45B roads.

5.2 Construction access

5.2.1.1 As outlined in **Volume 3, Appendix 26.1**, up to 22 indicative access points and associated access routes identified to support onshore infrastructure construction as shown in **Plate 5.2**. These access points, selected for the construction stage, will be confirmed during the detailed design stage following further technical assessment.

Plate 5.2 Access points and road network



5.2.1.2 The indicative access points identified in **Section 5.1** for construction traffic, provide access to the construction areas within the Onshore Red Line Boundary including:

- secondary construction compounds;
- primary construction compounds;
- landfall(s) construction compounds;
- onshore substation site construction compound; and
- onshore export cable corridor haul roads.

5.2.1.3 Temporary access tracks will be constructed to connect the indicative access points to the construction areas within the Onshore Red Line Boundary. The temporary access roads and haul roads are approximately 6m in width and will comprise crushed aggregates and a geotextile membrane. **Appendix A, Figure 1** illustrates the indicative location of access points and temporary access tracks.

5.2.1.4 An **Outline Construction Traffic Management Plan** (CTMP) has been submitted as part of the Application to manage construction traffic. The objectives of the Outline CTMP are as follows:

- ensuring the movement of people and materials in a safe, efficient, timely, and sustainable manner;
- keep construction traffic to a minimum during peak network periods to minimise as far as possible the impact on the road network;
- ensure that effects and disruption on local communities are minimised;
- minimise vehicle trips where possible; and
- limit the impacts on the natural and built environment.

5.2.1.5 The movement of abnormal loads (vehicle and load combinations that exceed the standard legal limits for weight, length, or width, making it too large or heavy to be carried on a conventional vehicle without special arrangements), will be in accordance with the Final CTMP and **Appendix 26.2: Abnormal Load Route Assessment**. There may a requirement for public road improvements to enable abnormal load movements.

5.2.1.6 The Final CTMP will be developed prior to commencement of the relevant stage of works, but will be produced in accordance with the principles, objectives and guidance provided in this **Outline CTMP**.

5.2.1.7 **Volume 4, Outline Construction Traffic Management Plan, Appendix A, Outline Core Path Management Plan** has been submitted as part of the Application and details how existing public access would be managed during the construction of the Project. **Volume 4, Outline Construction Traffic Management Plan, Appendix B, Outline Travel Plan** sets out the principles for managing the travel by construction personnel during the construction stage of the Project including setting out a plan to maximise the sustainability of travel methods used to get to and from onshore construction areas.

5.3 Operational access

5.3.1.1 The onshore substations will be unmanned, and monitoring of the onshore substations will be undertaken remotely using closed-circuit television technology and other remote monitoring equipment. Due to the nature of the Project, once operational, access to the onshore substations will be restricted to authorised personnel for the purposes of maintenance and inspection. Access to the onshore substations will be via the permanent

access road/s identified in **Appendix A, Figure 1.** Public access will not be permitted, with the security fencing installed during construction remaining in place.

5.3.1.2 Maintenance of the onshore export cable is expected to be minimal. During O&M, periodic testing of the cable is likely to be required (every two to five years). This will require access to the link boxes at defined inspection points along the onshore export cable corridor. Unscheduled maintenance or emergency repair visits may also be required. Vehicles will gain access using existing field or site access points to reach the relevant sections of the onshore export cable. Once complete, the ground and the access will be re-instated.

5.4 Public access

5.4.1.1 Within the Onshore Red Line Boundary there are a number of core paths and cycle facilities as identified in **Section 5.1**.

5.4.1.2 **Volume 4, Appendix 2, Outline Core Path Management Plan** (which forms an annex to the **Outline Construction Traffic Management Plan**), establishes a framework to protect public access during the onshore construction stage, resulting from potential interactions between construction traffic, construction works and users of core paths and cycle facilities. A combination of mitigation measures will be deployed to ensure the Project will minimise disruption to core path access.

5.5 Access for all

5.5.1.1 The legal requirements related to the Disability Discrimination Act 2005 (UK Parliament, 2005) must be taken into account in making reasonable adjustment to physical barriers, facilities and services. The final detailed design of the Project will be designed to be inclusive for those with accessibility restrictions.

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7. Glossary and Abbreviations

7.1 Abbreviations

Acronym	Definition
AIL	Abnormal Indivisible Load
AOD	above ordnance datum
AP	Access Point
CEMP	Construction Environmental Management Plan
DAS	Design and Access Statement
EGL	Eastern Green Link
EIA	Environmental Impact Assessment
GW	Gigawatts
HDD	Horizontal Directional Drill
HF	Harmonic Filter
HND	Holistic Network Design
Km	Kilometres
LDP	Local Development Plan
MLWS	Mean Low Water Springs
NE7	Northeast 7
NESO	National Energy System Operator
NPF4	National Planning Framework 4
O&M	operation and maintenance
OAA	Option Agreement Area
OLAS	Outline Landscape and Architectural Strategy
PAC	Pre-Application Consultation
PPiP	Planning Permission in Principle
SHR	Shunt Reactor
SPA	Special Protected Area
SSEN	Scottish and Southern Electricity Networks

Acronym	Definition
SSSI	Site of Special Scientific Interest
UXO	Unexploded ordnance

7.2 Glossary of terms

Term	Definition
Aberdeenshire Council	Aberdeenshire Council is the regulator for determining onshore applications for planning applications under the Town and Country Planning (Scotland) Act 1997 for all Project infrastructure located landward of the Mean Low Water Springs (MLWS).
Design Principles	Guiding concepts that shape the creation of effective, functional, and visually design of a Project, to influence decisions on layout, colour, typography, usability, and overall user experience.
EIA Report	The written output presenting the full findings of the EIA.
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').
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.
Mitigation	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).
Onshore	Pertaining to the landward side of Mean Low Water Springs.
Planning Permission in Principle (PPiP)	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.
Project	The MarramWind Offshore Wind Farm Project that is the subject of this EIA Report, as described in **Volume 1, Chapter 4: Project Description**.
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.
ScottishPower Renewables UK Limited	Part of the Iberdrola group and 100% owner of MarramWind Limited.

Term	Definition
Stakeholder	Person or organisation with a specific interest (commercial, professional or personal) in a particular issue.
Statutory Consultation	The undertaking of a consultation that is delivered in line with or beyond the minimum requirements of the relevant consenting regime(s) to obtain stakeholder feedback on the Project.
The Applicant	MarramWind Limited

Appendix A -
Figure 1 Onshore Red Line Boundary and indicative onshore infrastructure

Sheet 1

Sheet 2

Sheet 3

Sheet 4

Sheet 5

Scotstown Landfall

Lunderton North Landfall

Lunderton South Landfall

PETERHEAD

Peterhead Bay

- 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

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DATUM	OSGB 1936
PROJECTION	British National Grid
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PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 1 Onshore Red Line Boundary and indicative onshore infrastructure Overview

Design and Access Statement

NOT TO BE USED FOR NAVIGATION

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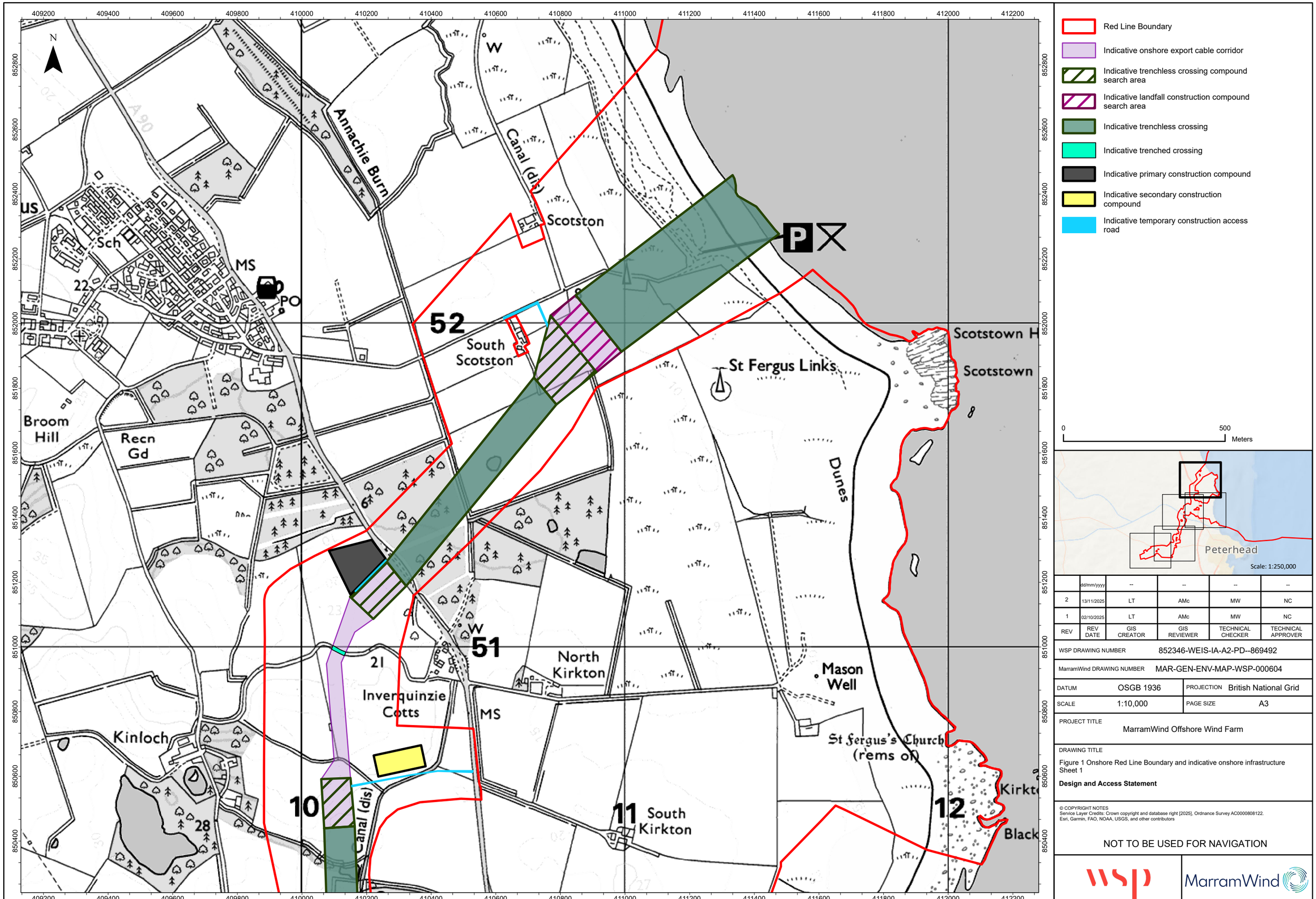
MarramWind



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PROJECT TITLE

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Figure 1 Onshore Red Line Boundary and indicative onshore infrastructure Sheet 1

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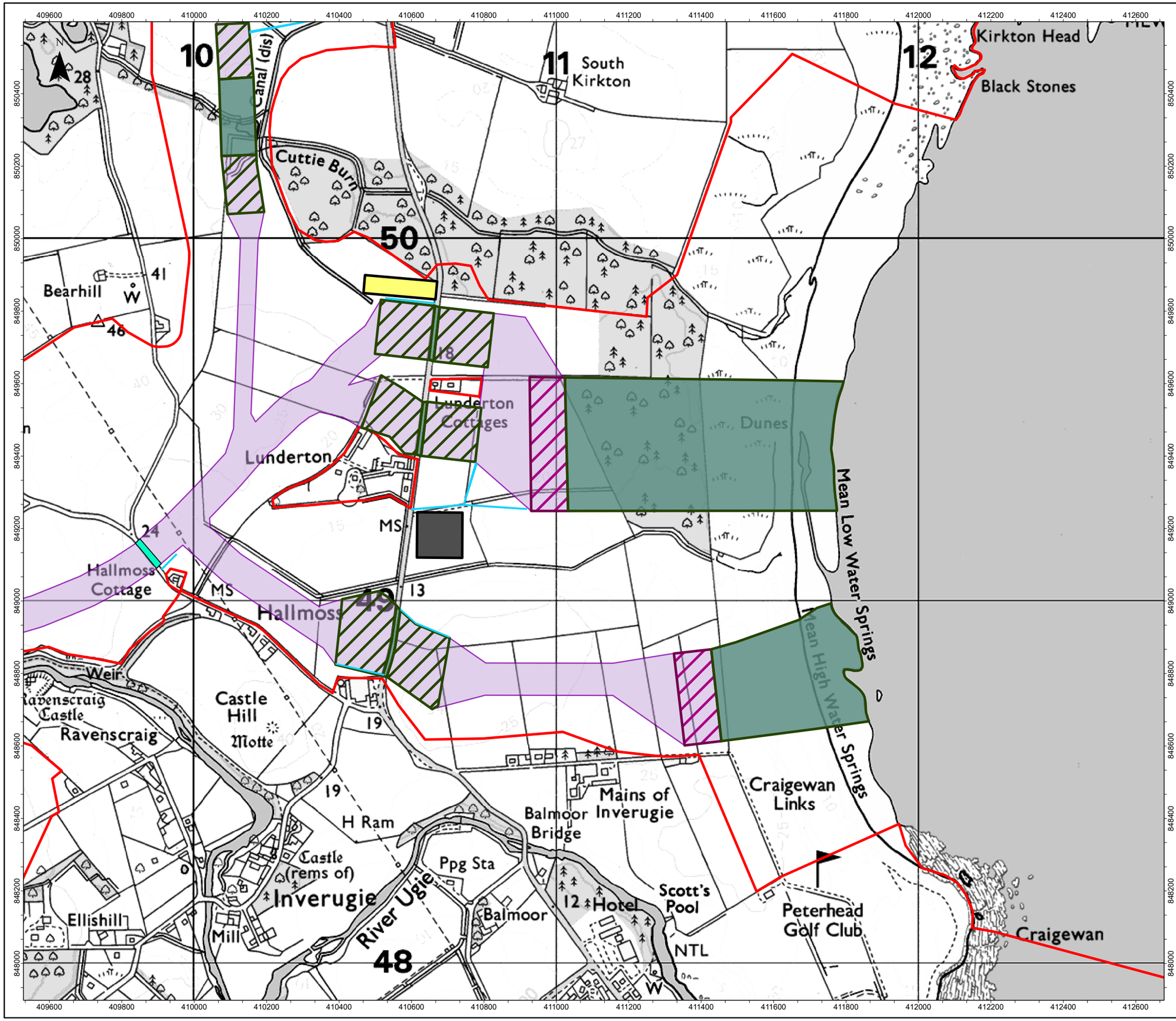
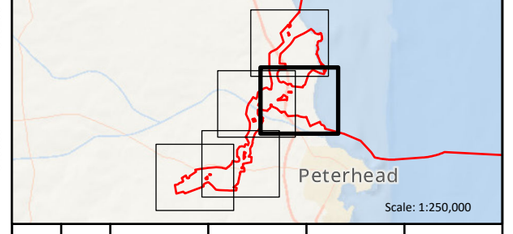


- Red Line Boundary
- Indicative onshore export cable corridor
- Indicative trenchless crossing compound search area
- Indicative landfall construction compound search area
- Indicative trenchless crossing
- Indicative trenched crossing
- Indicative primary construction compound
- Indicative secondary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

0 500 Meters



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PROJECT TITLE
MarramWind Offshore Wind Farm

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

Design and Access Statement

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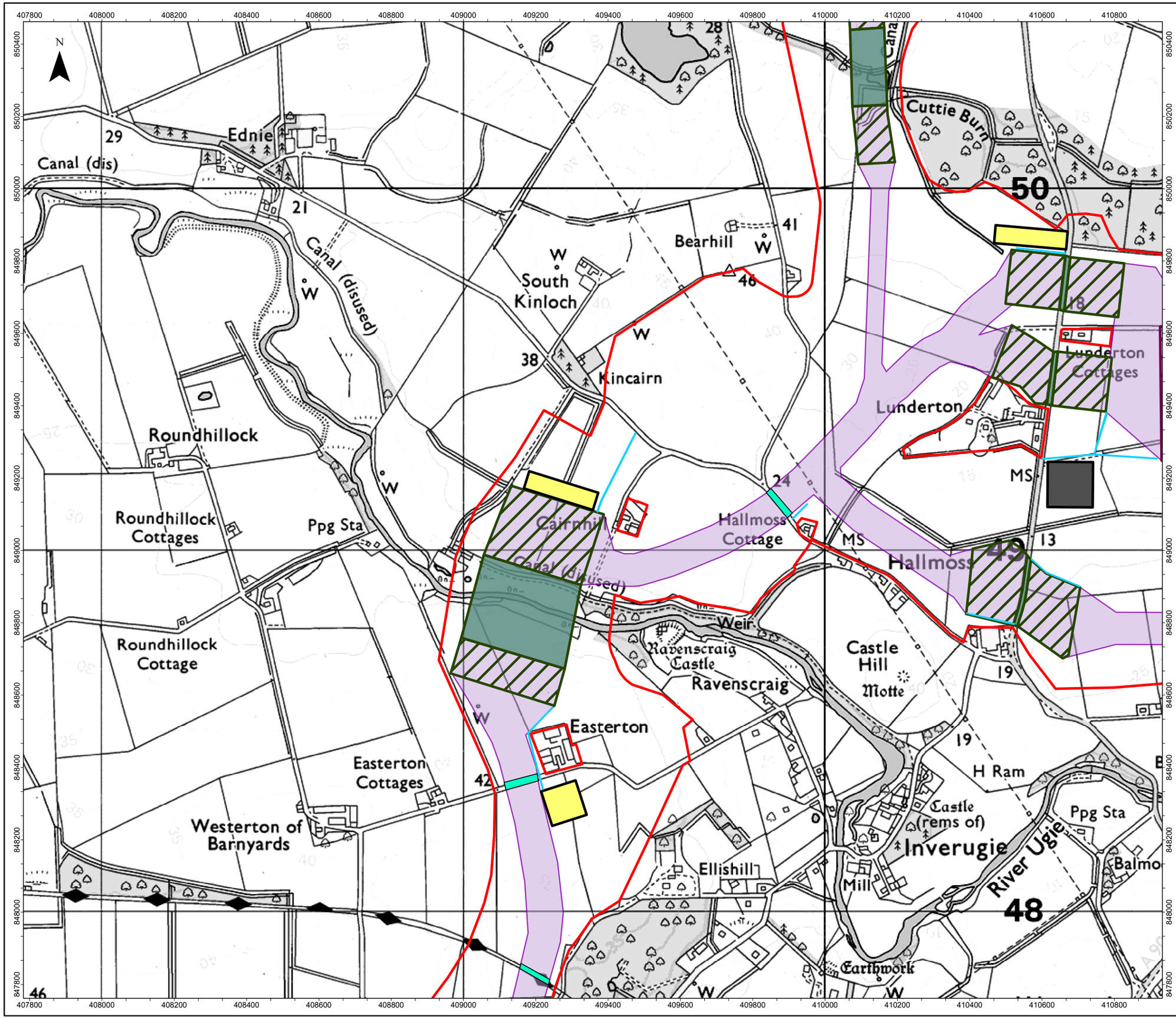

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PROJECT TITLE
MarramWind Offshore Wind Farm

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Figure 1 Onshore Red Line Boundary and indicative onshore infrastructure Sheet 3

Design and Access Statement

NOT TO BE USED FOR NAVIGATION

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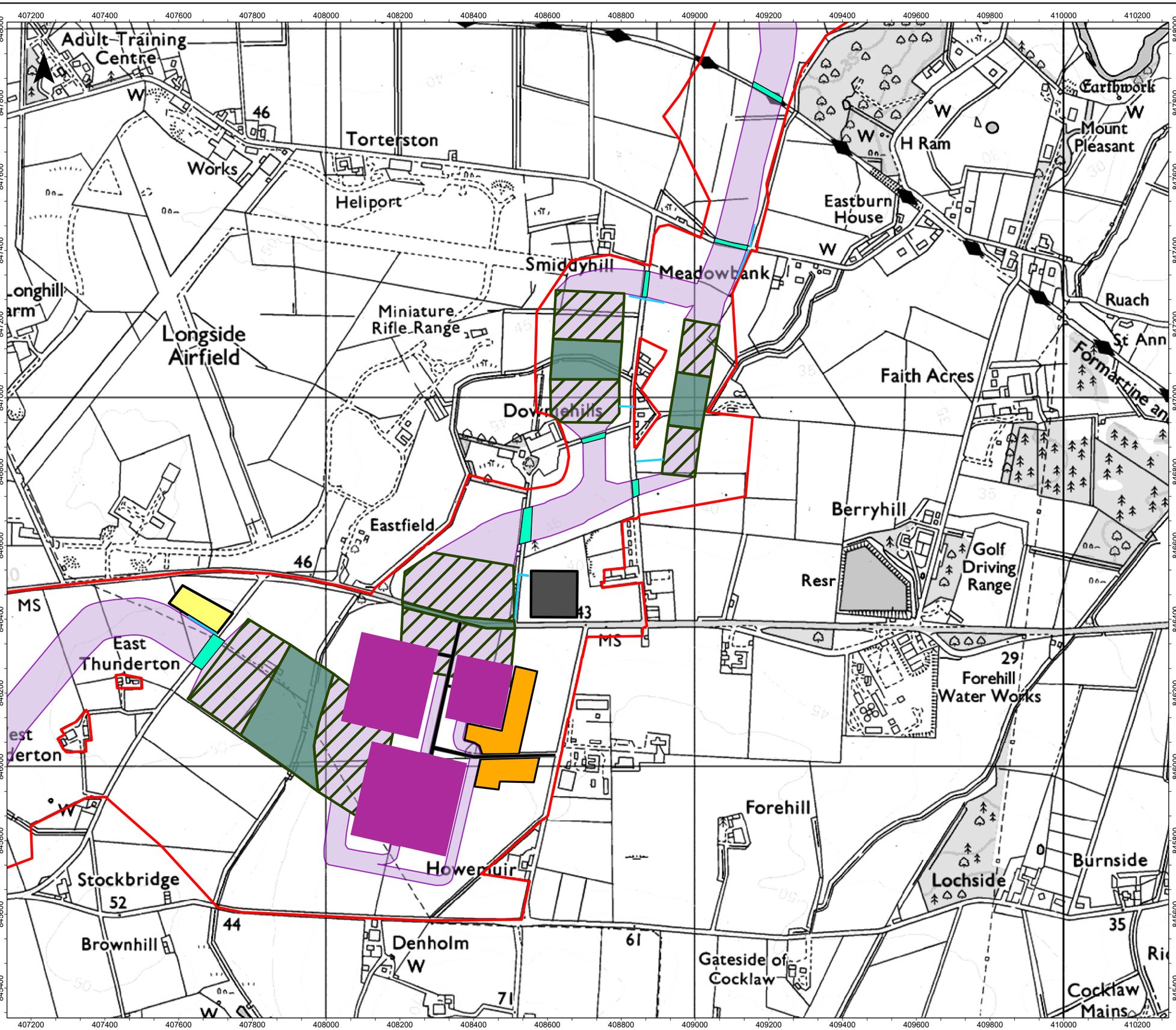
MarramWind



- Red Line Boundary
- Indicative onshore export cable corridor
- Indicative trenchless crossing compound search area
- Indicative trenchless crossing
- Indicative trenched crossing
- Indicative 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
	dd/mm/yyyy	--	--	--	--
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PROJECT TITLE
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DRAWING TITLE
Figure 1 Onshore Red Line Boundary and indicative onshore infrastructure Sheet 4

Design and Access Statement

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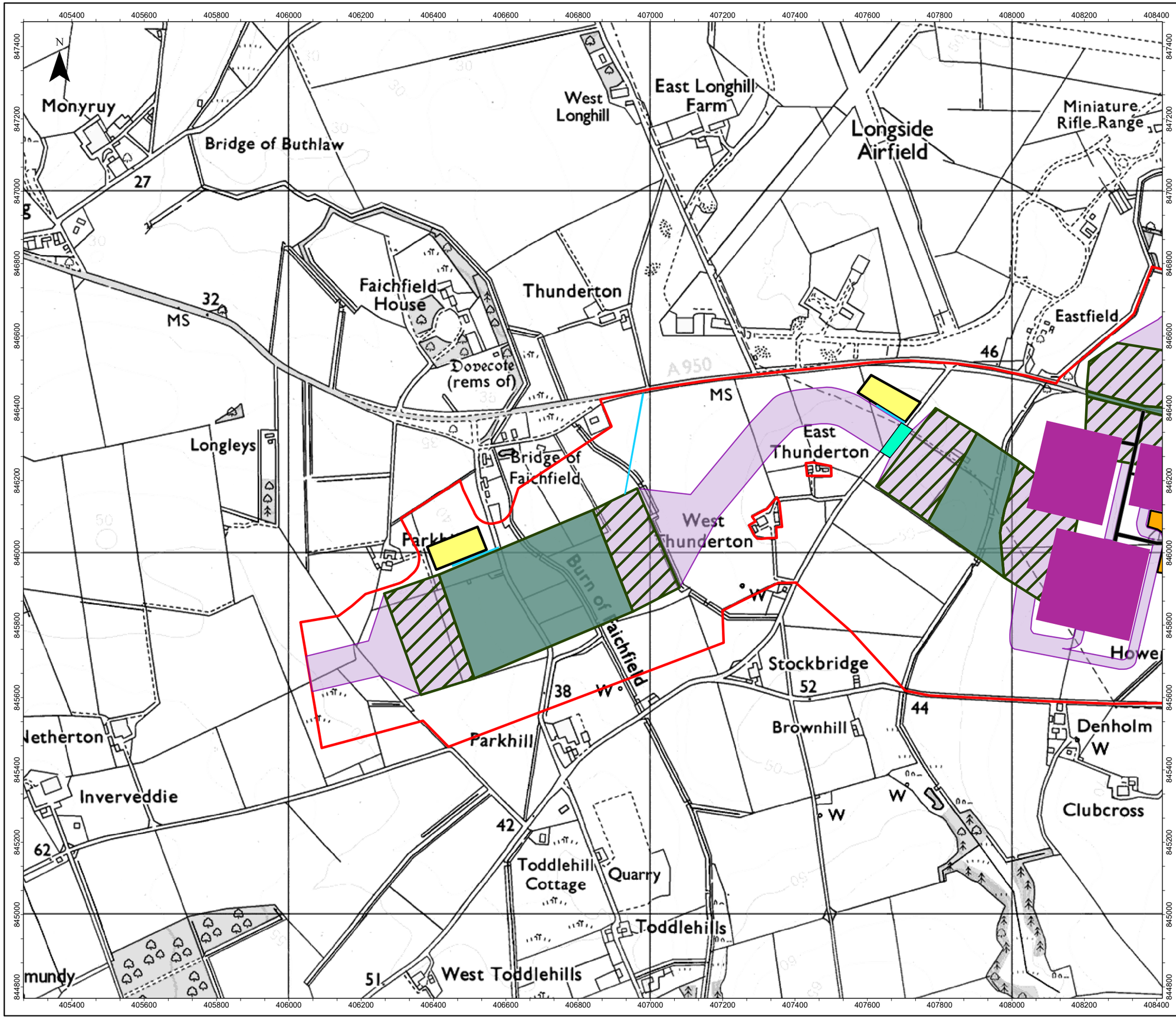


Red Line Boundary

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

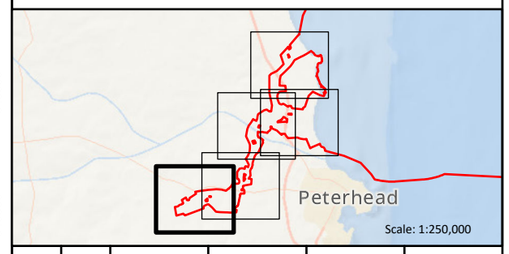
Onshore substation layout

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
	dd/mm/yyyy	--	--	--	--
2	13/11/2025	LT	AMc	MW	NC
1	02/10/2025	LT	AMc	MW	NC

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SCALE	1:10,000
PAGE SIZE	A3

PROJECT TITLE

MarramWind Offshore Wind Farm

DRAWING TITLE

Figure 1 Onshore Red Line Boundary and indicative onshore infrastructure Sheet 5

Design and Access Statement

NOT TO BE USED FOR NAVIGATION

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