

Seagreen 1A: Offshore Export Cable Corridor

Non-Technical Summary

March 2021

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Seagreen 1A Export Cable Corridor Environmental Impact Assessment Report: Non- Technical Summary

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1. Introduction

Seagreen Wind Energy Ltd (Seagreen) is a joint venture between SSE Renewables and Total. In 2014, Seagreen was awarded consent for the Seagreen Alpha and Bravo Offshore Wind Farms (OWFs). This consent covered the Seagreen Alpha and Bravo OWFs as well as the associated Offshore Transmission Asset (OTA) which will export energy generated from 114 of the 150 consented turbines to a landfall at Carnoustie in Angus. Together this consented infrastructure comprises ('The Seagreen Project').

In order to maximise the energy generation and facilitate the full export capacity of the Seagreen Project, Seagreen 1A Limited ('Seagreen 1A') are proposing to consent an additional export cable corridor and develop the associated infrastructure to connect up to 36 of the consented offshore wind turbines within the Seagreen Project area to the national electricity network in Cockenzie in East Lothian. This single offshore export cable infrastructure comprises the Seagreen 1A Project, hereafter referred to as the SG1A Project (Figure 1-1).

This document provides a Non-Technical Summary (NTS) of the Environmental Impact Assessment Report (EIAR) which has been produced to support the Marine Licence application for the offshore SG1A Project which comprises the offshore section of the proposed additional export cable corridor, from the Seagreen Project area to an identified landfall in Cockenzie. The EIAR has assessed the potential impacts of the offshore SG1A Project throughout construction, operation and decommissioning for the project alone and cumulatively with other relevant infrastructure projects.

The full EIAR and other supporting documents for the offshore SG1A Project Marine Licence application can be found on the project website:

<https://www.seagreen1a.com/>

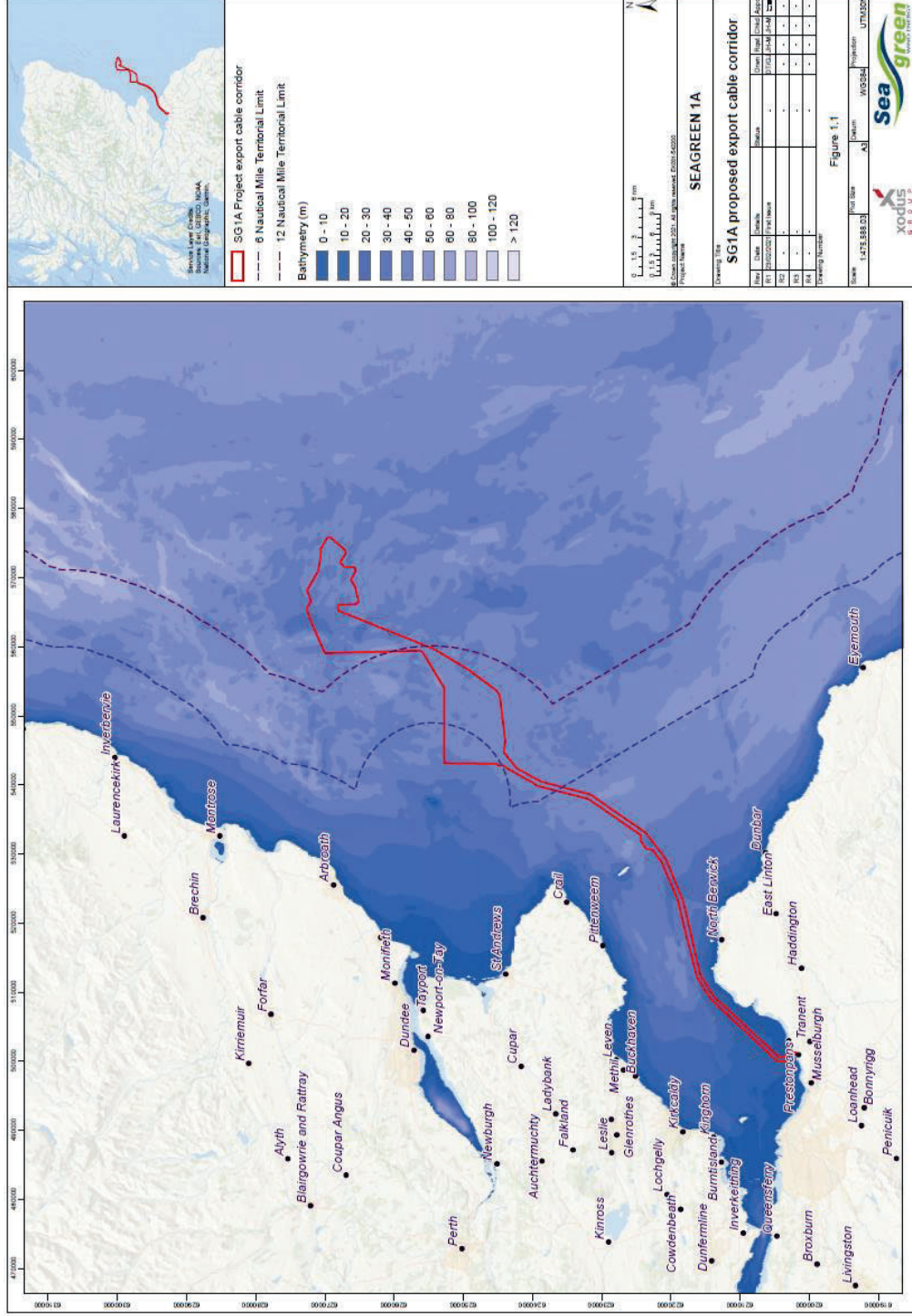


Figure 1.1 The Offshore SG1A Project

2. Project Need

In February 2020, Seagreen received a grid offer from National Grid for the Cockenzie substation in East Lothian with Transmission Entry Capacity (TEC) of 360MW. The Project is currently considering whether this capacity could be increased, through dialogue with National Grid. The SG1A Project, comprises one high voltage offshore export cable to mean high water springs (MHWS), cable landfall and connection to the onshore infrastructure. Scour protection and cable protection may also be required.

The proposed export cable infrastructure of the offshore SG1A Project will transmit electricity from up to 36 WTGs already consented in the Seagreen Project Area, via an OSP also consented under the Seagreen Project, to the new landfall location at Cockenzie.

An onshore EIAR has been prepared to accompany an application for Planning Permission in Principle, in accordance with The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. Any potential impacts which may result from the Onshore SG1A Project landward of MLWS are considered within the onshore EIAR (Seagreen 1A EIA Report Volume 2: Main Report (LF000012-CST-ON-LIC-DEV-REP-0002)).

3. Purpose of the EIAR

In December 2020, the offshore SG1A Project submitted a Screening Request to Marine Scotland, requesting that an environmental impact assessment (EIA) was not required for the offshore SG1A Project. Details of this Screening Request can be found in Appendix A of the EIAR. A Screening Opinion was received from MS-LOT on the 19th February 2021 confirming that Scottish Ministers have determined the offshore SG1A Project is an EIA project and therefore this EIAR has been produced in support of the Marine Licence application.

The purpose of the EIAR is to support the SG1A Project's Marine Licence application for a single offshore export cable. The EIAR is submitted in accordance with the requirements of the Marine Works (EIA) (Scotland) Regulations 2017, which transpose the amendments made to the EIA Directive 2011/92/EU by Directive 2014/52/EU.

This EIAR has also been produced and submitted in accordance with COVID-19 guidelines and protocols (The Marine Works and Marine Licensing (Miscellaneous Temporary Modifications) (Coronavirus) (Scotland) Regulations 2020). In line with this guidance, no hard copies of the EIAR have been provided at this stage but all application material can be found on the SG1A Project website (<https://www.seagreen1a.com/>).

In addition to this EIAR, a Nature Conservation Appraisal Report (NCA Report) has been produced (Appendix C of the EIAR) to provide detailed assessment of the offshore SG1A Project's potential for effect on protected sites designated for their nature conservation interests.

In accordance with The Marine Licensing (PAC) (Scotland) Regulations 2013, a Pre-Application Consultation Report has been produced and is provided as part of the SG1A Project Marine Licence application material.

This EIAR should be read in conjunction with the following documents:

- Marine Licence Application Form;
- Pre-application Consultation (PAC) Report;
- Screening Opinion and offshore SG1A Project Screening Report (Appendix A of the EIAR);
- Chart and WGS84 Co-ordinates of the Offshore SG1A Marine Construction Licence Boundary (Appendix B of the EIAR);
- Nature Conservation Appraisal (NCA) Report (Appendix C of the EIAR) and
- Navigational Risk Assessment (Appendix D of the EIAR).

4. Consenting, Licencing, Planning Policy and Legislative Framework

The offshore SG1A Project supports several policies and regulations which promote renewable energy generation both at an international and national scale. In addition, the offshore SG1A Project aims to support and comply with the policies under the Scottish Marine Planning framework, including those set out within the Scottish National Marine Plan (Scottish Government, 2015). These policies were considered for the cable installation, operation and decommissioning and in the assessment of environmental impacts.

The regulatory consents that are required for the installation and operation to the SG1A Project include Marine Licences under the Marine (Scotland) Act 2010 (for the section within the 12 nm territorial sea limit) and the Marine and Coastal Access Act 2009 (for the section beyond the 12 nm territorial sea limit). Marine Licence applications will be submitted to Marine Scotland Licencing Operations Team (MS-LOT) who will process and issue the licences on behalf of Scottish Ministers.

Several pieces of legislation shape the regulatory requirements that will support the Marine Licence applications, including the following:

- **Pre-Application Consultation:** Under The Marine Licensing (PAC) (Scotland) Regulations 2013 ('PAC Regulations'), public consultation and engagement in the form of a Pre-Application Consultation (PAC) Event must take place prior to a Marine Licence Application for the offshore SG1A Project. A virtual offshore PAC event for SG1A Project was undertaken in January 2021 and a PAC Report will be submitted alongside the SG1A Project Marine Licence application. The PAC event was undertaken in accordance with The Marine Works and Marine Licensing (Miscellaneous Temporary Modifications) (Coronavirus) (Scotland) Regulations 2020.
- **EIA:** An EIA is required for the offshore SG1A Project under The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) (for works within the 12 nm boundary) and The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) (in relation to works outwith the 12 nm boundary). This NTS and the EIAR has been produced in accordance with these regulations.
- **Marine Nature Conservation Appraisal:** Any Project in Scottish waters which has the potential to adversely affect a conservation site within the UK National Site Network must determine the potential impacts on the integrity of the protected site under the following pieces of

legislation: The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (the Habitats Regulations). Similarly, any Project in Scottish Waters must provide details of any potential impacts on protected features of a Nature Conservation Marine Protected Area (NCMPA) under the Marine (Scotland) Act 2010 and Marine and Coastal Access Act 2009. The offshore SG1A Project has produced a Marine Nature Conservation Appraisal (Appendix C) in support of the Marine Licence application and to fulfil the requirements of these regulations.

Other legislation is also listed within the EIAR which has shaped the project development/design of the offshore SG1A Project and the production of the EIAR.

5. Project Description

5.1 Project Components

In February 2020, the SG1A Project received a grid offer from National Grid for the Cockenzie substation in East Lothian with Transmission Entry Capacity (TEC) of 360MW. This was accepted by Seagreen in June 2020, with a connection date of October 2023. To enable the connection the following offshore infrastructure is proposed, which makes up the SG1A Project:

Offshore: one export cable of approximately 110 km in length from the Seagreen Offshore Wind Farm to the landfall at Cockenzie. The offshore SG1A Project overlaps considerably with the consented Inch Cape OWF export cable corridor, with the offshore SG1A export cable corridor running south and east of the Inch Cape OWF, north of the consented Neart na Gaoithe OWF and northwest of Berwick Bank and Marr Bank proposed OWFs (Figure 5.1).

At landfall, the SG1A offshore export cable will connect to an onshore export cable to a new onshore substation. The onshore cable infrastructure, above MLWS, will be consented under the Town and Country Planning Act (Scotland) 1997 and is not considered further within this EIAR and Marine Licence application.

Onshore: An onshore EIAR (The Seagreen 1A EIA Report Volume 2: Main Report (LF000012-CST-ON-LIC-DEV-REP-0002)) has been prepared to accompany the onshore planning application, in accordance with The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. The Seagreen 1A EIA Report Volume 2: Main Report (LF000012-CST-ON-LIC-DEV-REP-0002) considers the construction, operation and decommissioning of an onshore substation, onshore electricity cables and associated infrastructure required to export electricity to the national electricity transmission system at Cockenzie, East Lothian. In summary it includes:

- One shore end export cable between the Mean Low Water Spring (MLWS) mark and the transition joint bay;
- One transition joint bay, where the shore end export cable would interface with the onshore export cable;
- One onshore export cable, running from the transition joint bay to the onshore substation;
- Potential joint bay and temporary pulling pits, for installation of the onshore export cable (potentially located anywhere within the onshore export cable development zone);

- The onshore substation;
- One grid connection cable linking the onshore substation and the existing Cockenzie substation;
- Temporary construction compound and working areas; and
- Access and site tracks.

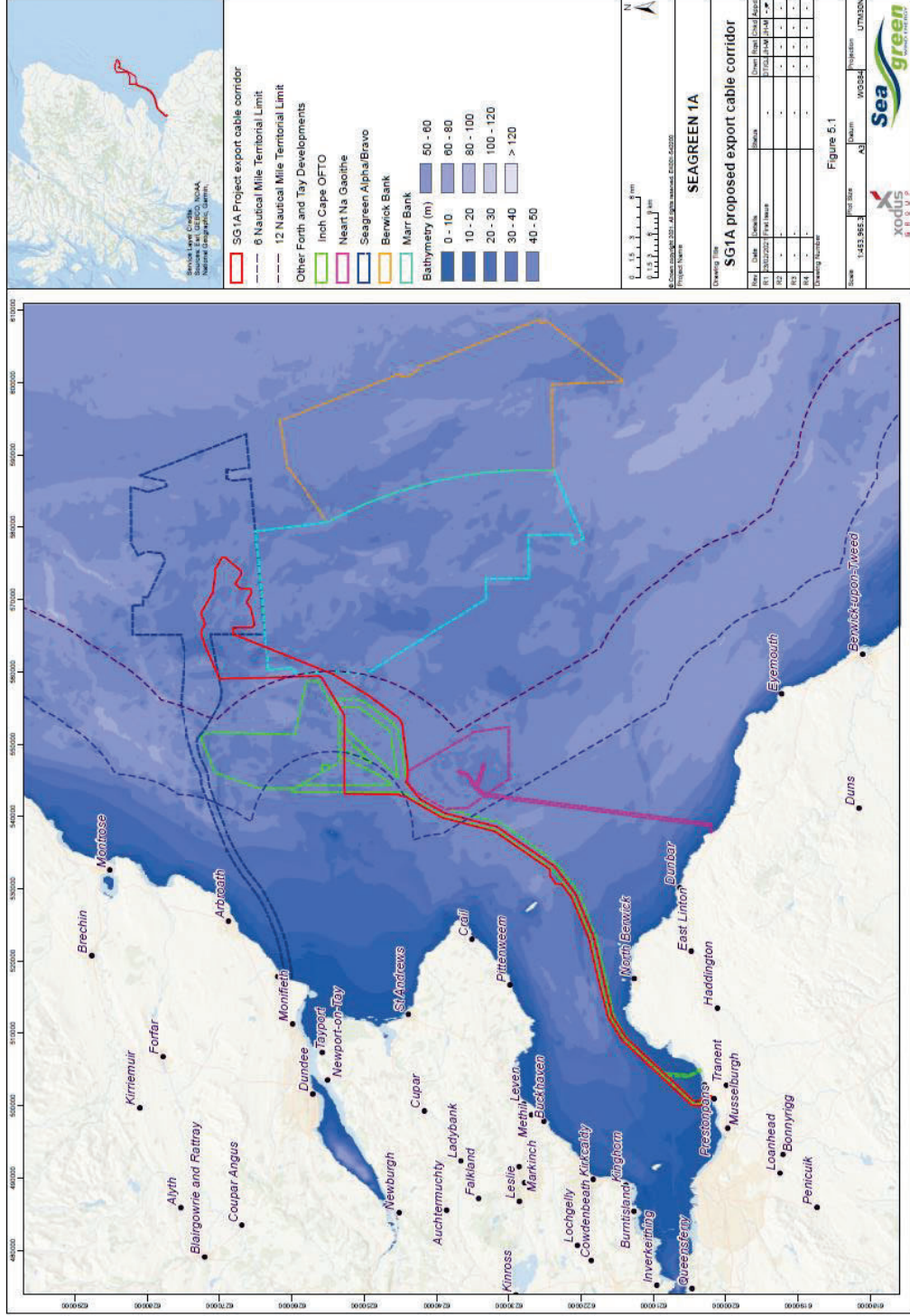


Figure 5.1 The SG1A offshore export cable corridor and surrounding OWF developments

5.2 Project Specifications

Key Parameters of the SG1A Project, which are used in assessments within this EIAR, are outlined in Table 5.1.

Table 5.1 – Key Project Parameters

Export Cable Parameters	Value
Maximum number of export cables	1
Maximum number of export cable trenches	1
Anticipated cable corridor width maximum (km)	1
Anticipated working width maximum (m)	100
Anticipated buried export cable length*	Approximately 80%
Maximum rock or mattress protected length*	Approximately 20%
Temporary zone of influence during cable installation (due to plough or ROV tracks)	6-10 m
If trenched, estimated width per trench (maximum) (m)	3 m
If trenched, cable burial depth (min – max) (m)	1-3 m
If protected, maximum height (m)	1 m
If protected, maximum width (m)	6 m
Number of construction vessels for export cable installation	2

*The project will aim to maximise achievable protection by burial, but allowance is made for cable protection where burial is not possible

5.2.1 Proposed Cable Construction

The SG1A Project export cable corridor will accommodate a single three-core High Voltage Alternating Current (HVAC) submarine cable connecting the Seagreen OWFs (via an Offshore Substation Platform (OSP)), to an identified landfall location in Cockenzie. The typical structure of a subsea cable is shown in Figure 5.2 and Figure 5.3. The cable will be approximately 110 km in length.

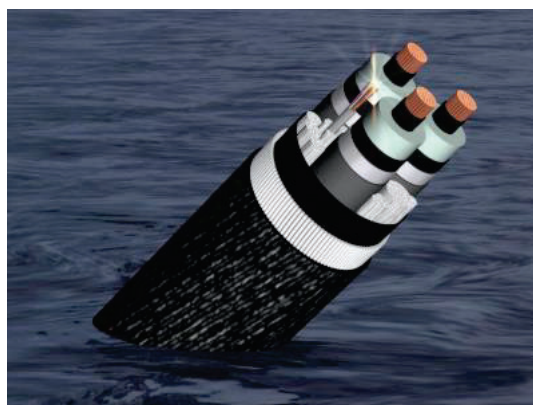
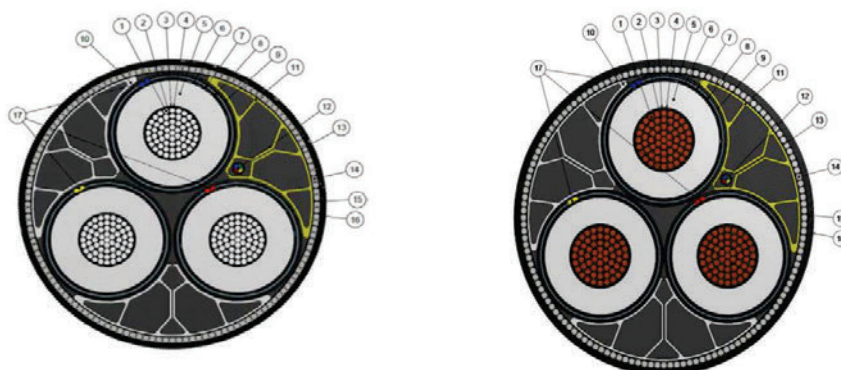


Figure 5.2 Typical subsea cable structure



Item	Description	Item	Description
1	Conductor	10	Filler Element
2	Conductor Filling Compound	11	Filler Element for Fibre Optic
3	Swellable Tape	12	Fibre Optic Element
4	Inner Semi-conductor	13	Armour Bedding
5	Insulation	14	Armour Wires
6	Outer Semi-conductor	15	Polypropylene Serving
7	Swellable Tape	16	Polypropylene Serving
8	Lead Sheath	17	Power Core ID – Plastic strand
9	Polyethylene (PE) Sheath		

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1	Conductor	10	Filler Element
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4	Inner Semi-conductor	13	Armour Bedding
5	Insulation	14	Armour Wires
6	Outer Semi-conductor	15	Polyethylene Sheath Bedding
7	Swellable Tape	16	Polyethylene Sheath
8	Lead Sheath	17	Power Core ID – Plastic strand
9	Polyethylene Sheath		

Figure 5.3 Examples of cross sections of aluminium and copper core subsea cables

5.2.2 Cable Protection

The cable will be appropriately protected to minimise any potential damage to cable integrity caused by other sea users and also to minimise any impacts of the cable on other sea users. The preferred protection method for the offshore SG1A Project is direct burial at a sufficient depth to minimise the potential interaction with other sea users which are in direct contact with the seabed (e.g. fishing vessels operating gear which is towed along the seabed and vessel anchors). The final target burial depths along the cable corridor will be informed by seabed conditions and interactions with other sea users.

However, in some areas direct burial may not be practicable e.g. hard seabed, boulder fields and crossings of other cables or pipelines. In these areas, an alternative protection method will be required such as rock

placement, concrete mattresses or grout bags. Alternative protection is used as contingency measure in these instances.

The final design of cable protection and stabilisation is in progress, from which the exact combination of burial and protection that will be required along the cable corridor will be decided.

The total area of works proposed is 277094600 m² or 277.1 km² with:

- 80% of the SG1A offshore export cable buried to a target depth of 1-3 m; and
- 20% of the SG1A offshore export cable protected particularly around the areas with rocky outcrops.

For the 20% of the SG1A export cable which may need to be protected, the following methods are being considered:

- Rock placement (preferred option);
- Concrete Mattresses;
- Grout Bags;
- A form of directional drill from the shore end at Cockenzie from above mean high water springs to below MLWS; and
- Cast iron Segments.

The EIAR has been based upon the tabulated amounts defined in Table 5.1 which demonstrates the footprint for the worst-case scenario and maximum possible protection. Any refinements of the SG1A Project may result in a reduction of deposits thereby decreasing seabed footprint.

5.3 Cable Corridor Location

5.3.1 Corridor Selection and Consideration of Alternatives

Crown Estate Scotland have expressed a desire to co-locate cables and cable corridors as much as possible in order to 'cluster' cable infrastructure and minimise seabed sterilisation. The offshore SG1A Project export cable corridor was selected through a desktop study review of environmental and engineering constraints. The aim was to reduce the overall export cable length whilst considering the following:

- Shipwreck locations;
- Munitions dumping sites;
- Locations and types of existing structures (e.g. other Wind Farms, cables and pipelines);
- Environmentally or culturally protected sites (SAC, SPA, Ramsar, MPA, SSSI, reefs and archaeology);
- Water depth; Seabed slope;
- Soft sediment;
- Hard bedrock within 2 m of the seabed; Boulders;

- Areas of obstructions and foul ground;
- Geomorphological features (e.g. scarps, drumlins); and
- Dredging areas.

Six potential cable corridor options were identified during the desktop study, as displayed in Figure 5.4.

The following key reasons were considered important in the selection of Cockenzie as the preferred landfall and Corridor 3 as the preferred SG1A project export cable corridor:

Landfall

- Cockenzie landfall site closer to onshore grid connection location, therefore shortening cable route length and potential for disturbance;
- Cockenzie landfall site has more favourable nearshore and onshore topography facilitating the HDD installation methodology; and
- Cockenzie landfall site requires a shorter HDD reducing risk of failure.

Corridor 3

- Shortest cable corridor option thus minimising area of disturbance;
- Key advice from Crown Estate Scotland, that the cable route should be designed to minimise seabed utilisation;
- Maximum overlap with consented Inch Cape cable route thus reducing cumulative area of disturbance therefore minimising environmental impact by reducing the potential cumulative footprint impacts and seabed utilisation;
- Avoids outcropping bedrock, therefore, limiting the requirement for mechanical cutter installation techniques or the use of non-burial cable protection measures;
- Avoids known dangerous shipwrecks and ground tackle, snag or stump features within 500 m of the centreline of the cable corridor;
- Avoids known dredging and foul areas;
- Avoids known munitions dumping areas; and
- Requires only a single cable crossing (some alternative corridors had with zero crossings but these were significantly longer).

The output of the desktop study and Pre-application Consultation feedback resulted in the selection of the SG1A Project offshore export cable corridor shown as the 'Marine Construction Licence Corridor Boundary' shown in Figure 5.5. For consistency, this will be referred to throughout this NTS, EIAR and supporting documents as the SG1A export cable corridor.

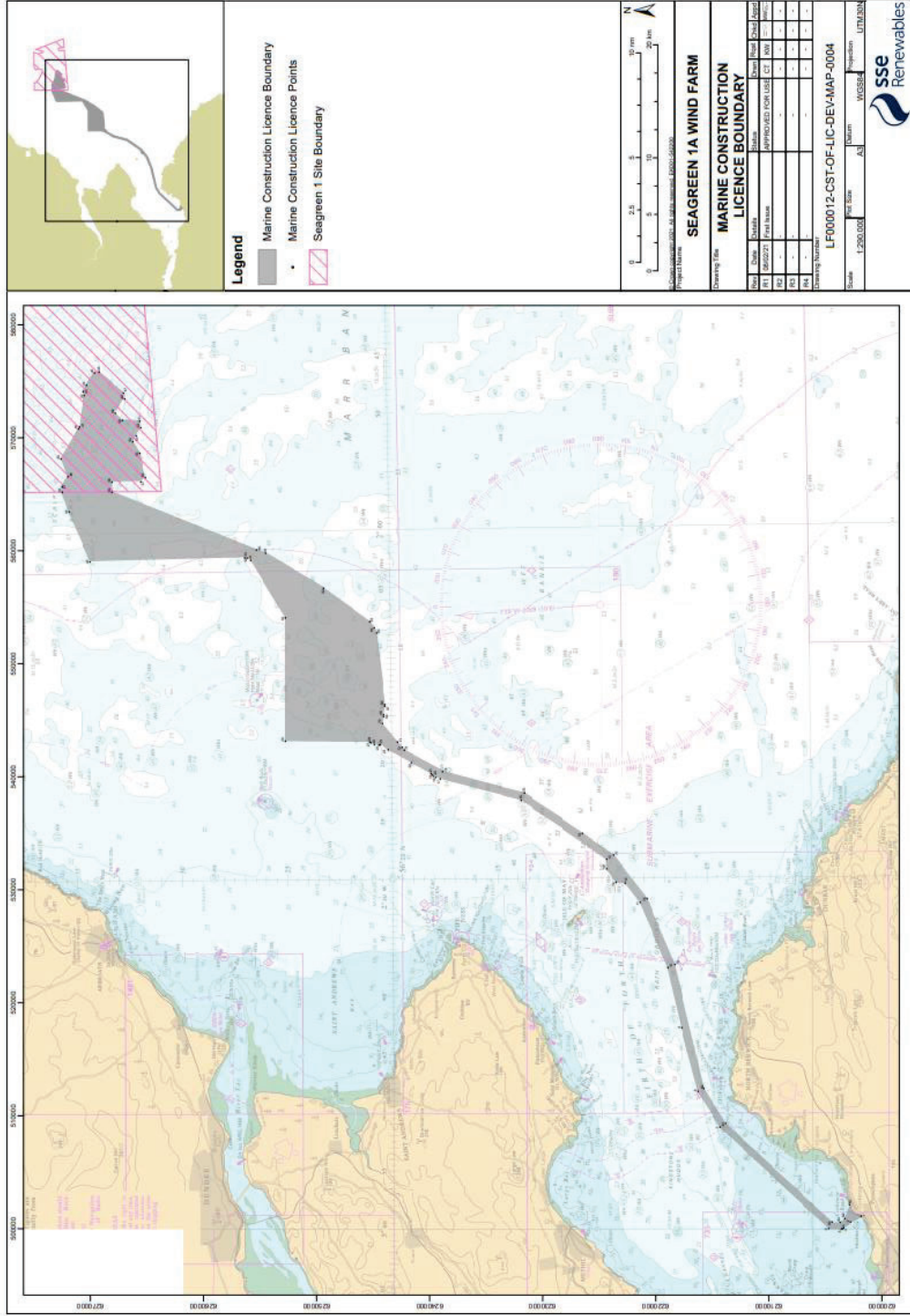


Figure 5.5 Marine Construction Licence Corridor Boundary

5.3.2 Proposed Cable Corridor

For much of its length, the proposed corridor overlaps and runs parallel to the approved Inch Cape Offshore Limited (ICOL) cable corridor and therefore benefits from an established precedent for consented marine cabling in this location, while reducing the spatial extent of cable installation works in the area. Minor refinements may be required at specific locations along the cable corridor to avoid specific features and/or mitigate potential environmental impacts.

As displayed in Figure 5.1, the proposed SG1A export cable corridor commences adjacent to the west of the Seagreen wind farm. The corridor then move south and passes through the north west corner of the Marr Bank Windfarm area. It then passes to the east of the Inch Cape wind farm site (with a 650 m separation), then to the north of Neart na Gaoithe wind farm site boundary (maintaining a 200m buffer) before crossing the main Inch Cape cable corridor. After crossing the main Inch Cape cable the cable will run parallel to the west of the Inch Cape cable to landfall at Cockenzie.

5.3.3 Cable burial and installation

In order to protect cable infrastructure and minimise disruption to other marine users, protection is by maximising burial.

Cable burial depth, targeted at between 1-3 m along the corridor, and will be determined by ground conditions, the cable burial risk assessment (CBRA) and a detailed hazard identification survey, which will assess the different locations and the various shipping and dredging activities.

The exact details of the cable installation technique to be employed will be confirmed when the contract for installation is awarded. It is however envisaged that a variety of installation and burial techniques will be required due to the variable nature of the seabed along the proposed SG1A Project export cable corridor.

Where this is not possible, for example at crossings with existing cables, or where the seabed characteristics are inappropriate for burial, additional cable protection measures may need to be applied. This is described in detail in Section 5.2.2.

Different approaches and techniques are available for SG1A Project export cable installation. These are:

- cable lay with post lay burial using a jetting ROV, or a mechanical trencher; and
- simultaneous cable lay and burial, using a cable plough or a mechanical trencher.
- A combination of methods may be used for cable installations, depending on ground conditions.

5.4 Project Phases

5.4.1 Installation

The indicative construction programme is provided in Table 5.2.

Table 5.2 Indicative SG1A offshore export cable installation schedule

Activity	Estimated duration (worst case scenario) excluding weather downtime
Seabed preparations	4 weeks
Cockenzie Landfall preparation and form of HDD	2 months dependant on length of drill
Cable lay with post lay burial using a jetting ROV, or a mechanical trencher; and/or simultaneous cable lay and burial, using a cable plough or a mechanical trencher	Up to 6 weeks
OSP Cable Pull in	1 week
External Protection	1 week dependant on extents
Post-lay survey	1 week

5.4.2 Operation, Inspection, Maintenance and Decommissioning

Operation and Maintenance (O&M) of the offshore SG1A Project export cable after commissioning will comprise of both scheduled and unscheduled events. Scheduled works on the offshore electrical infrastructure will include regular monitoring or survey, statutory inspection and routine inspection visits. When necessary, retrofitting and upgrading works may also take place. Any offshore survey works will normally be timetabled for the summer months, given the typically more settled weather and longer day light hours. It is noted that maintenance/monitoring work is expected to be less disruptive and span a shorter period than cable installation (during the construction period). Twenty-four hour working will also be evaluated, as this type of solution could be delivered from a mothership stationed offshore.

The SG1A Project will have an O&M team in place for the day to day management and control of the project infrastructure.

The requirement to decommission the offshore SG1A export cable is a condition of The Crown Estate lease and is also incorporated in the statutory consenting process through the provisions of the Energy Act 2004. Under the statutory and licensing processes, the appointed Offshore Transmission Owner (OFTO) will be required to prepare a detailed decommissioning programme and set aside funds for the purposes of decommissioning. The decommissioning programme will consider the latest technological developments, legislation and environmental requirements at the time that the work is due to be carried out.

5.5 Existing studies and validation marine surveys

The SG1A Project area is well studied with considerable existing data available for the Forth and Tay region, including:

- Benthic surveys:
 - EUSeaMap;
 - The Seagreen Project (characterisation and pre-construction);
 - Inch Cape and Neart na Gaoithe survey data and EIA; and

- Cooper and Barry (2017). A big data approach to macrofaunal baseline assessment, monitoring and sustainable exploitation of the seabed.
- Marine Ornithology surveys:
 - Seagreen, Inch Cape and Neart na Gaoithe OWF monthly boat-based surveys;
 - Seagreen, Inch Cape and Neart na Gaoithe OWF monthly aerial surveys;
 - Seagreen 1A Project (offshore cable): intertidal and nearshore bird surveys up to 1.5 km from shore (MHWS), July 2020 to present; and
 - Inch Cape offshore cable: intertidal and nearshore bird surveys up to 1.5 km from shore (MHWS), January 2012 to January 2013.

The SG1A Project has undertaken its own validation survey works during winter 2020/21 including offshore geophysical, geotechnical and benthic surveys as well as nearshore and intertidal ornithology surveys. Completion of these SG1A Project surveys is expected in Spring 2021. Details are provided in Section 3 of the EIAR.

6. Consultation

In accordance with COVID-19 guidelines and protocols (The Marine Works and Marine Licensing (Miscellaneous Temporary Modifications) (Coronavirus) (Scotland) Regulations 2020), all consultation carried out to inform the EIAR and the Marine Licence application for the SG1A Project was undertaken using teleconference, email, website updates, virtual events or by telephone.

In December 2020, the offshore SG1A Project submitted a Screening Report (SG1A Screening Report - LF000012-CST-OF-LIC-DEV-REP-0001). The consultation comments received, along with the SG1A Project response and where the comment is addressed within the EIAR, or other Marine Licence application documents, is provided in Table 5-1 of the EIAR.

In response to the SG1A Project Screening Report, the SG1A Project received a number of requests from consultees to consider specific impacts in the environmental assessment undertaken to support the Marine Licence application, particularly in relation to marine mammals, EMF, pre-construction activities and protected sites which are all now included within either the EIAR or in Appendix C of the EIAR. A meeting was held with NatureScot, Marine Scotland Science and MS-LOT on 19th February 2021. Attendees at the meeting agreed with the approach being taken in particular in relation to the environmental topics to be included in any environmental assessment undertaken to support the Marine Licence application.

The SG1A Project has engaged with key stakeholders from an early stage and throughout the EIA process, in order to inform the EIAR and ensure that the development is acceptable in terms of design and environmental effects.

The SG1A Project has engaged a Fisheries Liaison Officer since November 2020 (Xodus Group). This has ensured consistent, thorough and frequent consultation has been carried out with fisheries stakeholders via associations, and with independent vessel operators. Consultation will continue with fisheries

stakeholders and other marine users. In addition, consultation has been undertaken with shipping stakeholders with regards to navigational safety as part of the navigation risk assessment process.

Public consultation and engagement with the local community has been undertaken ahead of the Marine Licence Application through the PAC virtual event in January 2021. Details are provided within the SG1A PAC Report (LF000012-CST-EV-LIC-DEV-REP-0001).

7. The Environmental Impact Assessment Process

7.1 Overview

Environmental Impact Assessment (EIA) is an iterative tool for examining and assessing the impacts and effects of the construction, operation and decommissioning stages of a development on the environment. The purpose of an EIA is to carry out an independent assessment of the 'likely significant effects' of a project, both adverse and beneficial. It is a systematic and evidence-based process and comprises the following broad stages:

- Determining issues to be considered within the EIA;
- Collection of baseline data, consultation and desk-based study, to describe and characterise the existing environmental conditions, as a basis for the impact assessment process;
- Identification and assessment of potential environmental impacts and conclusions on the likely significance of impacts identified; and
- Identification of mitigation measures and monitoring, or management strategies that can be applied, to avoid, reduce, or remove identified adverse impacts and the subsequent assessment of residual impact significance.

7.2 Potential impacts assessed in the EIAR

The environmental topics and impacts which have been informed by the SG1A Screening Report and subsequent stakeholder feedback. The following environmental topics have been considered further within the EIAR:

- **Biological Environment:**
 - Nature Fish and Shellfish Resource (Section 7 of the EIAR)
 - Marine Mammals (Section 8 of the EIAR);
- **Human Environment:**
 - Commercial Fisheries (Section 9 of the EIAR);
 - Shipping and Navigation (Section 10 of the EIAR); and
 - Marine Archaeology (Section 11 of the EIAR).

The potential impacts which have been included for each of the environmental topics are listed within the EIAR and within summaries of each of the impact assessments within this NTS.

In addition, a Nature Conservation Appraisal Report (NCA Report) has been produced (Appendix C of the EIAR) to provide detailed assessment of the offshore SG1A Project’s potential for effect on protected sites designated for their nature conservation interests. The NCA Report provides an assessment of potential effects on designated sites, specifically considering benthic ecology and offshore ornithology, in order for the offshore SG1A Project to be compliant with The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (the Habitats Regulations) and in the offshore marine area by the Conservation of Offshore Marine Habitats and Species Regulations 2017 (the Offshore Habitats Regulations).

7.3 Impact Assessment Methodology

For each of the environmental topics being assessed, the appropriate professional guidelines for EIA have been applied and followed as considered necessary, along with any other relevant guidance documents and best practice techniques. As a result, where the standard assessment criteria and terminology set out below are not followed for a specific environmental topic, this will be identified within the relevant environmental section of the EIAR, along with specific information on the preferred assessment criteria that have been applied.

The environmental assessment is conducted in two stages. The first stage characterises the nature of the impacts (positive or negative) and the second determines the level of significance of the impacts. An impact results from the consequences of a change (or impact) acting on a resource / receptor. The impact significance will depend on the interaction between the degree of impact (e.g. extent, duration, magnitude, permanence etc.) and the sensitivity, value or number of the receptor in each case.

Through the EIA process, potential impacts resulting from the construction, operation and decommissioning of the SG1A Project have been considered.

7.3.1 Significance of Impact

Taking both the sensitivity / value of the resource / receptor and the magnitude of impact into consideration, a determination of impact significance is made. Table 7.1 shows how the two elements can be combined to give an overall impact significance.

Table 7.1 Categorising impact significance

Magnitude of Impact	Sensitivity/Value of Receptor			
	High	Medium	Low	Negligible
Major/Large/High	Major	Major	Moderate	Minor
Moderate/Medium	Major	Moderate	Minor	Negligible
Minor/Small/Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

Table 7.2 Categorisation and Definition of Impacts

Category	Definition
Negligible	No detectable change to the environment resulting in no significant impact.
Minor	A detectable, but non-material change to the environment resulting in no significant impact.
Moderate	A material, but non-fundamental change to the environment, resulting in a possible significant impact.
Major	A fundamental change to the environment, resulting in a significant impact.

For the purposes of this EIAR, potential impacts identified as major or moderate are generally considered to be significant in EIA terms and mitigation may be required, while impacts identified as minor or negligible are generally considered to be not significant in EIA terms.

7.4 Cumulative Impacts

Alongside the potential impacts resulting from the SG1A Project alone, it is necessary to consider any cumulative impacts. Cumulative impacts occur when the impacts to a receptor from two or more projects combine, either because they occur in the same timeframe or because there is a spatial overlap of the impact.

The following projects will be considered in the cumulative assessment presented in this EIAR:

- The Seagreen Project (consented, pre-construction);
- Berwick Bank OWF (scoping);
- Marr Bank OWF (concept/early planning);
- Inch Cape OWF (consented);
- Neart na Gaoithe OWF (under construction); and
- Aggregate extraction, cables and interconnector projects that meet the criteria below.

These projects were selected using the following criteria:

- Whether the timing of construction is likely to overlap with or occur directly before or after the construction period of the SG1A Project;
- Whether the project was within 30 km of the SG1A Project export cable corridor; and
- Whether any operational effects of the project were likely to have a cumulative effect with the installation phase of the SG1A Project, particularly related to shipping and navigation, and commercial fisheries.

7.5 Mitigation

Several embedded mitigation measures have been proposed, which include measures which avoid or minimise impacts through project design ('primary mitigation') or through the implementation of standard industry practices ('tertiary mitigation'). These embedded mitigation measures are 'built in' to the project and have been considered within the topic-specific assessments provided within the EIAR. Full details of all embedded mitigation can be found in Section 4 of the EIAR.

Where potentially significant adverse impacts have not been eliminated by project design, or embedded mitigation, additional mitigation measures may be required. These measures are determined by the relevant technical experts and agreement with relevant stakeholders has been sought wherever possible. Following the identification of additional mitigation measures, a residual impact significance is identified. The assessment of residual impact occurs following the identification and consideration of any additional mitigation and this process is presented and summarised within each technical section of this EIA Report.

7.5.1 Implementation

To ensure implementation of the embedded and additional mitigation in this EIAR, the schedule of mitigation (see Section 12 of the EIAR) will be included in the SG1A Project Construction Environmental Management Plan (CEMP) which will be produced prior to construction.

Any Contractor appointed to work on the SG1A Project is expected to work to the SG1A Project CEMP and will be required to produce a Contractor specific EMP in line with the project CEMP.

The CEMP will provide the policy and plans of how the construction and cable installation works are to be managed from an environmental perspective. The CEMP will clearly set out the lines of communication between SG1A Project Management Team and Environmental Lead, and the Contractor's Management Team and their Environmental Representative. It will set out the roles and responsibilities of the various parties to with regard to ensuring that all environmental mitigation is appropriately implemented.

In addition to the CEMP, the Fisheries Liaison and Mitigation Action Plan (FLMAP) will be implemented. The FLMAP will provide further details on implementation of mitigation specific to commercial fisheries and how stakeholder consultation will continue as the SG1A Project develops.

8. Natural Fish and Shellfish Resource

The natural fish and shellfish resource assessment describes the potential impacts of the SG1A Project on fish and shellfish species in the vicinity of the export cable corridor. This assessment considers the legislation and policy that protects fish and shellfish species and was guided by the stakeholder responses to the Screening Report.

Environmental Baseline

A desktop study was undertaken to identify the fish and shellfish species likely to be present within the vicinity of the SG1A Project export cable corridor using publicly available datasets and baseline information available for the nearby OWF developments. The commercial fishing landings data indicates that *Nephrops* (known also as Norway lobster and langoustine) are present at high densities within the SG1A Project export cable corridor, especially within 12nm. Other commercially important species such as lobster, crab and scallops are also present at lower densities mostly in the offshore section of the SG1A export cable corridor. The SG1A Project may overlap with the spawning grounds for several fish species which spawn on the seabed, such as sandeel and *Nephrops*. The herring spawning grounds in proximity to the SG1A Project do not overlap with the SG1A export cable corridor. The SG1A Project may also interact with migratory fish which are designated within protected sites along the East coast, including the River Teith SAC. Further information is provided on the River Teith SAC within the Nature Conservation Appraisal (NCA) Report (LF000012- CST-OF-LIC-DEV-REP-0002).

More detailed environmental information was provided for species within the vicinity of the SG1A Project which were considered to be of the greatest sensitivity to the potential impacts arising from the cable installation, operation and decommissioning. These are:

- Seabed dependent fish and shellfish species (i.e. those that rely on the seabed for some or all of their life cycle). These species are potentially vulnerable to temporary seabed disturbance (sandeel, *Nephrops*, scallops and herring); and
- Migratory fish species that are sensitive to Electro-Magnetic Field (EMF) emissions (Atlantic salmon, sea lamprey and European eel).

Potential Impacts Considered

The impact assessment considered the potential impact of the seabed disturbance, such as temporary habitat loss or disturbance, resulting from installation and decommissioning activities on seabed dependent species and the potential operational impacts of EMF emissions to migratory fish species.

Summary of Assessment

Seabed disturbance was assessed as being highly localised and temporary. The assessment concluded that the impacts were **minor adverse** for scallops and sandeel and **negligible** for *Nephrops* and herring. The impacts of EMF on all migratory fish species were considered to be **negligible**.

Therefore, the potential impacts of the offshore SG1A Project on fish and shellfish receptors is considered to be **not significant**, in all instances, both from the project alone and along with other existing or planned

developments in all instances. Considering this, no additional mitigation measures are required for natural fish and shellfish resource.

9. Marine Mammals

The marine mammal impact assessment details the potential impacts of the SG1A Project on marine mammal receptors. Marine mammals, which includes cetaceans (whales, dolphins and porpoises) and seals, are protected under various legislative items and policies.

Environmental Baseline

A desktop review of publicly available datasets identified the marine mammal species that may be affected by the Offshore SG1A Project. The most common cetacean species recorded within the region include harbour porpoise, bottlenose dolphin, minke whale and white-beaked dolphin. Cetaceans recorded at lower densities or less frequently observed, include Atlantic white-sided dolphin, killer whale, Risso's dolphin, fin whale, humpback whale and short-beaked common dolphin. There are no protected areas which are crossed by the SG1A Project export cable corridor.

Grey and harbour seals (the most common of the seal species in the UK), occur at low densities along the SG1A Project export cable corridor. However, densities of grey seal increase where the SG1A Project approaches North Berwick. There are also several protected areas designated for seal features within the vicinity of the SG1A Project.

This includes the Isle of May SAC, designated for grey seals (3.9 km from the SG1A Project) and the Firth of Tay and Eden Estuary SAC, designated for harbour seals (30 km from the SG1A Project). There are also areas which are designated seal haul outs, which are areas on land where seals moult and breed (Marine Scotland, 2014), within the vicinity of the SG1A Project.

Potential Impacts Considered

The potential impact of the underwater noise emissions associated with the SG1A Project was assessed for the marine mammal receptors identified during the desktop study. The assessment considered the potential for injury or disturbance resulting from underwater noise which may include the following:

- Injury – physiological damage to auditory or other internal organs; and
- Disturbance (temporary or continuous) – disruptions to behavioural patterns, including, but not limited to migration, breathing, nursing, breeding, foraging, socialising and/or sheltering.

This assessment was informed by underwater noise modelling.

Summary of Assessment

The impact assessment concluded that there could be the potential the disturbance of cetaceans and seals as a result of some of the offshore survey activities which is predicted to be of **moderate** significance. These survey activities could occur both pre - and post-installation.

To mitigate against the potential impact of the survey activities, Marine Mammal Observers (MMOs) will be employed and the equipment will be operated in such a way to minimise the potential impact to marine mammals. When considering the implementation of the mitigation measures, these impacts are reduced to **minor** and are therefore, not significant. Cumulative impacts with nearby developments were also identified, however, these are also considered to be **minor adverse** and therefore **not significant**.

All other impacts on marine mammal receptors from survey activities during construction, operation and decommissioning are of **minor adverse** significance and therefore **not significant**.

10. Commercial Fisheries

A detailed in the EIAR, an impact assessment of the impacts of the SG1A Project on commercial fisheries was undertaken in line with best practice guidance. The assessment was informed by early and ongoing engagement with key commercial fisheries stakeholders and through a review of number of other publicly available data sources.

Environmental Baseline

The commercial fishing activity was characterised within the SG1A Project export cable corridor commercial fisheries study area, which consists of five International Council for the Exploration of the Sea (ICES) statistical rectangles¹.

The main fishing methods which are operated within the SG1A Project commercial fisheries study area include demersal (bottom) trawls, scallop dredges and static fishing methods (creeling). According to MMO fisheries statistics, the highest average landings values from the SG1A Project commercial fisheries study area between 2014-2018 were of *Nephrops*, scallops, lobsters, crabs and to a lesser extent squid, haddock and whiting. Data from the Scottish White Fish Producers Association indicates that the main activity by static fishing gear operators is in waters north, south and south east of the SG1A Project. Automatic Identification System data and georeferenced plotter photographs from Pittenweem trawlers support the Vessel Monitoring System (VMS) effort data from the NMPi that the majority of demersal trawling for *Nephrops* is within 12 NM in relation to the SG1A Project, with scallop dredging activity further offshore in the north-eastern areas of the SG1A Project. Further details on the commercial fisheries baseline and associated figures to present the fishing activity are provided in Section 9 of the SG1A EIAR.

SG1A has identified mitigation measures which will be included within the Fisheries Liaison Mitigation Action Plan (FLMAP), which will be a live document. The FLMAP will include the following mitigation measures:

- Appointment of a FLO to maintain proactive consultation with the fishing industry;

¹ ICES rectangles are a grid reference system used to define areas of the sea.

- Adherence to best practice guidance with regards to fisheries liaison (e.g. FLOWW, 2014; 2015);
- Timely and efficient distribution of Notice to Mariners (NtM), Kingfisher notifications and other navigational warnings of the location, expected duration and nature of works associated with the SG1A Project;
- The appointment of Offshore Fisheries Liaison Officers (OFLOs) on board SG1A contracted vessels, as appropriate;
- Notification to the UK Hydrographic Office (UKHO) and Kingfisher of the proposed works /installed cable to facilitate the promulgation of maritime safety information and updating of nautical /admiralty charts and publications;
- Following review of the post-installation survey where areas of concern or where the target DoB is not achieved a geophysical survey will be carried out. (e.g. high-resolution multi-beam echo sounder, side scan sonar, video) in areas of the SG1A export cable where target burial is not achieved. The resulting in 3D digital terrain maps and 2D cross sections of protection and the adjacent seabed and to make this available to fishermen.
- If required, and in consideration of the data which is collected during the geophysical survey, SG1A will carry out a single over trawl survey within 12 months of the installation and any protection works being completed. The locations and the extents of the over trawl surveys will be informed by the geophysical survey results, through currently available fishing activity data and through further postconstruction consultation with fisheries stakeholders and agreed with MSLOT.
- SG1A will conduct a detailed over trawl survey specification that will include a description of the appropriate vessel to undertake the survey, the type, specifications and rigging configuration of the trawl to be deployed and the towing pattern to be followed. The parameters to be assessed would also be defined along with acceptable limits relative to normal towing characteristics. SG1A will not undertake any further investigation in this respect where it is confirmed that the target depth of burial (DoB) has been achieved. The SG1A Project proposes to discuss and confirm the full details of the over trawl survey approach with Marine Scotland, in consultation with fisheries stakeholders.
- SG1A will carry out a risk assessment for the need for guard vessels during works; or in the event of a cable exposure during operational phase of the cable's life. Where required, guard vessels will be confirmed through a standard
- An evidence-based cooperation payment policy will be in place for static fishing gear operators which are requested to relocate fishing gear from the SG1A Project, where relevant, in accordance with FLOWW guidance (2014, 2015).

Potential impacts considered and summary of impact assessment

A summary of the potential impacts to commercial fisheries receptors and the assessment of the impact significance are provided in Table 10.1.

Table 10.1 Summary of the potential impacts which were considered in relation to commercial fisheries receptor

Phase	Impact	Receptor	Sensitivity of receptor	Magnitude	Impact significance	Additional Mitigation Measures	Residual Magnitude	Residual Impact Significance	Conclusion
Construction (and Decommissioning)	Temporary loss or restricted access to fishing grounds	Vessels working static gear	Medium	Medium	Moderate	SGIA has identified mitigation measures which will be included within the Fisheries Liaison Mitigation Action Plan (FLMAP), which will be a live document.	Low	Minor	Not significant
		Scallop dredgers	Negligible	Negligible	Negligible		Negligible	Negligible	Not significant
		Demersal trawling & <i>Nephrops</i> trawling	Low	Low	Minor		Negligible	Negligible	Not significant
Displacement of fishing activity into other areas	Displacement of fishing activity into other areas	Static fishing gear vessels	Medium	Low	Minor	SGIA has identified mitigation measures which will be included within the Fisheries Liaison Mitigation Action Plan (FLMAP),	Low	Minor	Not significant
		Scallop dredgers	Negligible	Low	Negligible		Low	Negligible	Not significant
		Demersal trawling & <i>Nephrops</i> trawling	Low	Low	Negligible		Low	Negligible	Not significant

Phase	Impact	Receptor	Sensitivity of receptor	Magnitude	Impact significance	Additional Mitigation Measures	Residual Magnitude	Residual Impact Significance	Conclusion	
Operation	Safety issues for fishing vessels	All fishing vessels	Extremely Unlikely	Serious	Tolerable	No additional mitigation beyond embedded mitigation	Tolerable		Not significant	
	Long term loss or restricted access to fishing grounds	Vessels working static gear	Medium	Low	Minor	SGIA has identified mitigation measures which will be included within the Fisheries Liaison Mitigation Action Plan (FLMAP), which will be a live document.	Negligible	Negligible	Not significant	
	Long term loss or restricted access to fishing grounds	Scallop dredgers Demersal trawling & <i>Nephrops</i> trawling	Low	Low	Negligible	SGIA has identified mitigation measures which will be included within the Fisheries Liaison Mitigation Action Plan (FLMAP), which will be a live document.	Negligible	Negligible	Not significant	
Displacement of fishing activity into other areas	Vessels working static gear Scallop dredgers Demersal trawling & <i>Nephrops</i> trawling	Medium	Low	Minor	SGIA has identified mitigation measures which will be included within the	Negligible	Negligible	Not significant		

Phase	Impact	Receptor	Sensitivity of receptor	Magnitude	Impact significance	Additional Mitigation Measures	Residual Magnitude	Residual Impact Significance	Conclusion
	Safety issues for fishing vessels	All fishing vessels	Extremely Unlikely	Serious	Tolerable	No additional mitigation beyond embedded mitigation	Tolerable		Not significant
						Fisheries Liaison Mitigation Action Plan (FLMAP), which will be a live document.			

11. Shipping and Navigation

The Shipping and Navigation assessment was conducted in accordance with relevant policies and guidance and considered stakeholder feedback received at two separate meetings in January 2021. This assessment was supported by a Navigational Risk Assessment (NRA) undertaken by Anatec Ltd (Appendix D of the EIAR) which provides a detailed assessment of the potential navigational risks associated with the offshore SG1A Project.

Environmental Baseline

A desktop study was undertaken to characterise the baseline (i.e. receiving) environment. This study identified and characterised the navigational features, maritime incidents, maritime traffic, anchoring activities, fishing activities and recreational vessel use within the vicinity of the SG1A Project.

The baseline data analysis identified several navigational features within the vicinity of the SG1A Project export cable corridor (Figure 11.1). Those located within the Firth of Forth include ports and terminals, shipping channels, pilot boarding areas and anchorage areas. Notably, the SG1A Project export cable corridor overlaps with the jurisdiction of Forth Ports Limited and intersects a designated anchorage area / anchor berth. Other notable navigational features in the vicinity of the SG1A Project export cable corridor include Ministry of Defence (MoD) practice and exercise areas (PEXAs), chartered ammunition dumping grounds, foul areas, a historical extraction area and the Neart Na Gaoithe and Inch Cape OWFs. One oil and gas pipeline is intersected by the SG1A Project export cable corridor.

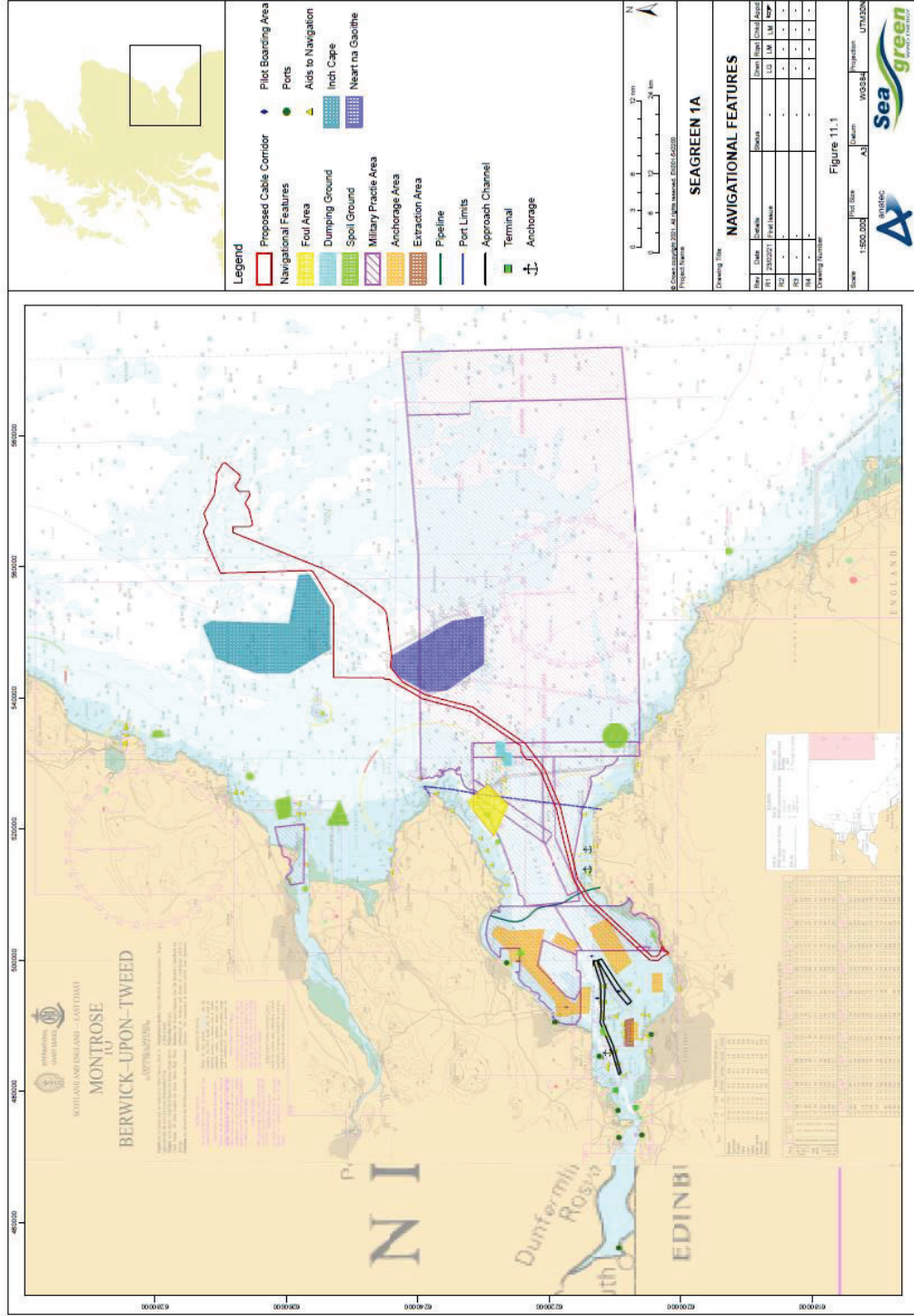


Figure 11.1 Navigational features in the vicinity of the SG1A Project export cable corridor

Maritime incident data was reviewed, and it was identified that incidents were predominantly associated with the machinery failure of fishing or dry cargo vessels. However, maritime incidents resulting from dangerous or hazardous circumstances also occurred.

Autonomic Identification System (AIS) vessel tracking data over a twelve-month period (January to December 2019) within a 5 nautical mile boundary around the SG1A Project export cable corridor was reviewed. This data revealed that the area is used mainly by fishing vessels, followed by tanker and cargo vessels. The busiest month was July and the quietest January, and the busiest section of the export cable corridor occurs at the entrances and exits of ports within the Firth of Forth.

A review of anchoring activity data revealed that vessels anchor within the vicinity of the cable corridor, predominantly associated with the designated anchorage areas nearby to the SG1A Project cable corridor.

Fishing activity was recorded along the entire length of the SG1A Project export cable corridor. The majority of the fishing vessels travel at slow speeds, which indicates that they are actively engaging in fishing activity. Fishing vessels were operating demersal (a.k.a. bottom) trawls were most common, which consist of nets being towed along the seabed. The busiest month was July and the quietest January.

Recreational vessel use is busiest in July. Notably, there are several recreational facilities in the Firth of Forth nearby to the SG1A Project export cable corridor.

Potential impacts considered

The impact assessment was informed by the baseline data described above and within the EIAR, as well as through the feedback received during stakeholder consultation. This characterises the risks using the IMO FSA methodology as 'Unacceptable', 'Tolerable' or 'Broadly Acceptable' (IMO, 2002). Construction impacts that were reviewed included the those relating to the collision risk, disruption of other sea users, allision with third-party wind turbines, and the risk associated with vessel anchors and fishing gear interacting with exposed cables. Operation and maintenance impacts that were reviewed included the risk associated with the cable interacting with vessel anchors or fishing gear, vessel grounding due to reduced under keel clearance, collision risk, and magnetic compass interference.

Summary of assessment

The outcomes of the impact assessment concluded that the potential impacts of the offshore SG1A Project were **Broadly Acceptable** or **Tolerable**, both from the project alone and cumulatively with other projects. Additional mitigation measures which could be implemented include minimising the length of time that the cable is left exposed, the circulation of information to shipping and navigation receptors, and the implementation of a post-lay compass deviation survey.

12. Marine Archaeology

The Marine Archaeology impact assessment outlines the potential impacts of the offshore SG1A Project on the marine historic environment. This has been produced in accordance with relevant guidance and policy

and with a consideration of feedback received on the offshore SG1A Project Screening Report from Historic Environment Scotland (HES).

Environmental baseline

The baseline data analysis identified and characterised marine archaeological features within the vicinity of the offshore SG1A Project. The baseline analysis identified several marine archaeology assets of relevance, including the potential for prehistoric archaeology and landscapes and historic UXO, shipwrecks and lost aircraft. The seabed surveys of nearby developments have also identified seabed anomalies which could potentially indicate the presence of archaeological features lying within the SG1A Project export cable corridor.

Several shipwrecks were identified as potentially being of relevant to the impact assessment, identified through public datasets (Figure 12.1). Five shipwrecks were identified through the Inch Cape Export Cable surveys as lying within the SG1A Project export cable corridor. One of these wrecks is considered to be of moderate importance, due to the fact that it is associated with loss of life in World War II (WW2).

Five lost aircraft potentially were also identified as being relevant to the SG1A Project export cable corridor.

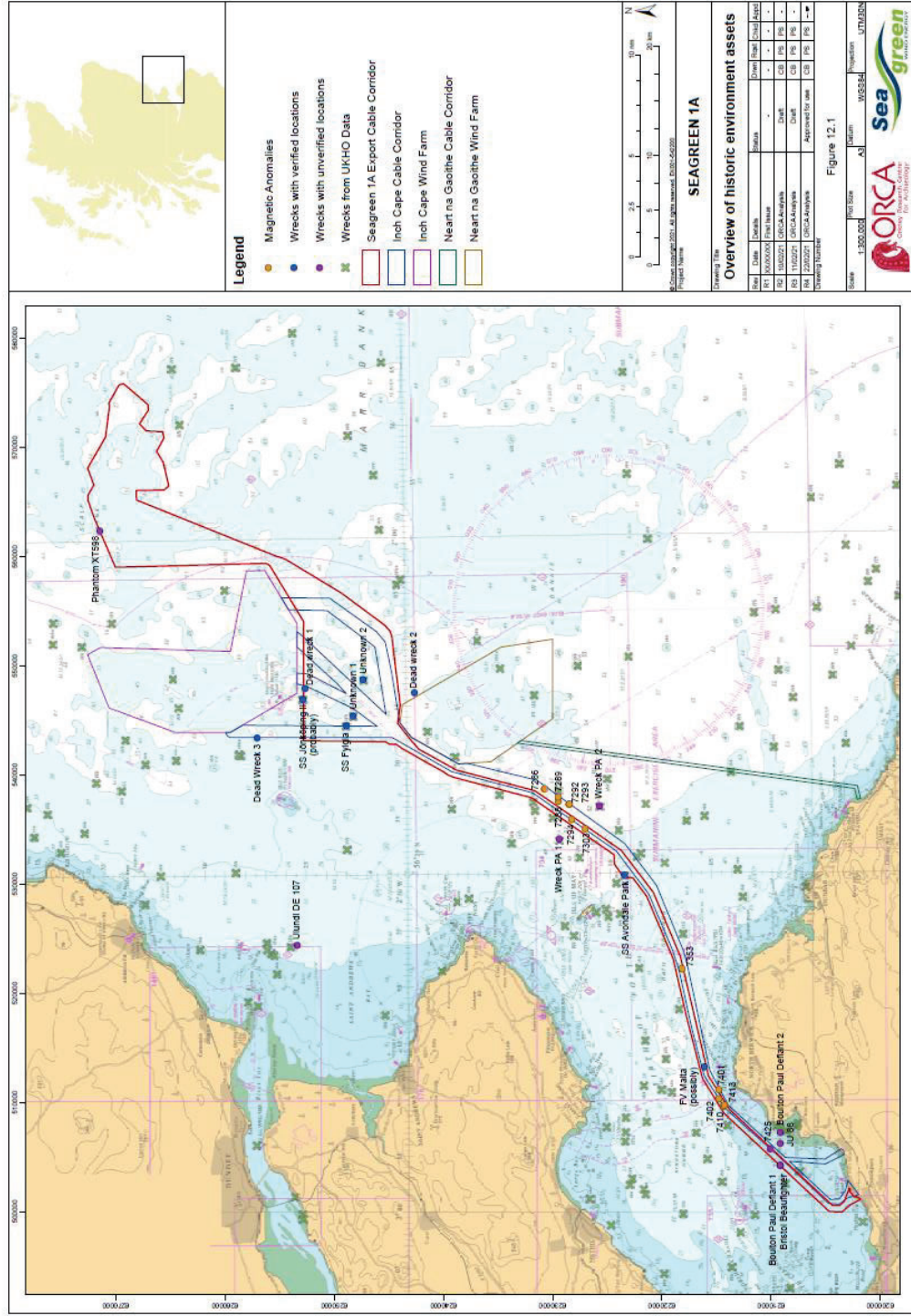


Figure 12.1 Potential wrecks with verified and unverified locations

Potential impacts considered

The Marine Archaeology impact assessment reviewed the potential impacts to marine archaeology features arising from direct and indirect damage or destruction during cable installation construction, operation and decommissioning. In order to avoid the potential damage or destruction of marine archaeological features, the final SG1A Project offshore cable route will be designed to avoid any known marine archaeological assets, wherever possible, using the latest marine survey data collected by the SG1A Project in Spring 2021. A Written Scheme of Investigation (WSI) and a Protocol for the Accidental Discovery (PAD) will also be produced which will set out the mitigation to be set in place to avoid or minimise any impacts on marine archaeological features.

Summary of assessment

When considering the avoidance for known marine archaeological assets, the outcomes of the impact assessment concluded that the impact resulting from any damage or destruction to marine archaeological features was **minor** for all potential SG1A Project activities occurring during construction, operation and decommissioning. Therefore, all impacts are considered **not significant**, for both the Project alone and when considered cumulatively with other developments.

13. Conclusion

The EIAR assessed the potential impacts of the offshore SG1A Project and no significant environmental impacts were identified. The SG1A Project have committed to avoiding or minimising environmental impacts through the implementation of embedded and additional mitigation measures. In conjunction with ongoing dialogue with key stakeholders, this will be key in ensuring the successful implementation of the offshore SG1A Project.

