

Project Title	Seagreen Wind Energy Ltd
Document Reference Number	LF000009-CST-OF-PRG-0002

Construction Programme (CoP)

Section 36 Consent Condition 9, Offshore Transmission Asset (OTA)
Marine Licence Condition 3.2.2.3 and Landfall Alternative Cable Installation Marine
Licence Condition 3.1.1
For the approval of Scottish Ministers

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Purpose of the Plan

This Construction Programme (CoP) is submitted to address the specific requirements of the relevant conditions attached to

(1) the Section 36 (S36) Consents granted by the Scottish Ministers to SAWEL under section 36 of the Electricity Act 1989 (in respect of the Alpha Offshore Wind Farm) and to Seagreen Bravo Wind Energy Limited (SBWEL) (in respect of the Bravo Offshore Wind Farm) on 10 October 2014 both as varied by the Scottish Ministers by decision letter issued pursuant to an application under section 36C of the Electricity Act 1989 on 28 August 2018 and, in respect of the consent applicable to the Bravo Offshore Wind Farm, as assigned to SAWEL on 22 November 2019; and

(2) OTA Marine Licence granted by the Scottish Ministers under the Marine (Scotland) Act 2010 and the Marine and Coastal Access Act 2009 on 10 October 2014, as amended by the revised marine licence granted by the Scottish Ministers on 6 March 2019 (reference 04678/19/0) in respect of the Seagreen Offshore Transmission Assets (OTA) associated with the Seagreen Alpha and Seagreen Bravo Wind Farms (OWFs) (as varied, the OTA Marine Licence); and

(3) the Marine Licence granted by the Scottish Ministers under the Marine (Scotland) Act 2010 on 21 November 2019 and amended on 24 February 2020 (ref 07050/20/0) and 18 August 2021 (ref MS-00009445).

for the Seagreen Alpha and Seagreen Bravo Offshore Wind Farms (OWFs) and their associated Offshore Transmission Assets (OTA).

Seagreen Alpha and Seagreen Bravo OWFs and the OTA are collectively referred to as the 'Seagreen Project'. This CoP has been prepared to discharge consent conditions for the Seagreen Project simultaneously.

The overall aim of the CoP is to set out the intended construction programme for the Seagreen Project.

All Seagreen Contractors (including their Sub-Contractors) involved in the Seagreen Project are required to comply with this CoP through conditions of contract.

Construction Programme Overview

Structure of the Plan

The CoP is structured as follows:

Section 1	Provides an overview of the Seagreen Project and the consent requirements that underpin the content of this CoP. It also sets out the process for making updates and amendments
Section 2	Sets out the scope and objectives of the CoP
Section 3	Provides an overview of the Construction Programme and Key Milestone Dates
Sections 4&5	Provides the delivery and construction schedule for the Wind Farms and the OTA, respectively
Section 6	Provides contingency considerations for the Wind Farms and the OTA
Section 7	Demonstrates compliance with the original application and commitments made
Appendix A	Lists the Abbreviations and Definitions used in the CoP
Appendix B	Sets out the CoP Change Management Procedure
Appendix C	Sets out the Construction Programme as a summary timeline
Appendix D	Sets out the Communications Protocol developed between Seagreen and MOD Barry Buddon Firing Range

Scope of the Plan

This CoP covers, in line with the requirements of the consents conditions, and in line with industry standards and good practice, the following in relation to the Seagreen Project:

- The proposed date for commencement of construction;
- The proposed timings of mobilisation of plant and delivery of materials including onshore laydown areas;
- The proposed timings and sequencing of construction work for all elements of the Seagreen Project;
- Contingency planning for poor weather or other delays;
- The scheduled date for final commissioning of the Seagreen Project; and
- A communications protocol developed between Seagreen and MOD Barry Buddon Firing Range

Plan Audience

This CoP will be submitted for approval to the Scottish Ministers/Licensing Authority in consultation with other stakeholders, in relation to monitoring compliance with the specific requirements of the relevant consent conditions.

Compliance with this CoP will be monitored by Seagreen's Ecological Clerk of Works (ECOW), Seagreen's appointed Contractors and the Marine Scotland Licensing and Operations Team (MS-LOT).

Copies of this CoP are to be held in the following locations:

- Seagreen's head office;
- Seagreen's construction office and marine coordination centre;
- at the premises of any Contractor, including the Seagreen ECOW, acting on behalf of Seagreen; and
- aboard any vessel engaged in the Wind Farm/OTA construction phase.

1. Introduction

1.1 Consents and Licences

Seagreen Wind Energy Limited (SWEL, hereafter referred to as 'Seagreen') was awarded Section 36 Consents (S36 Consents) under the Electricity Act 1989 by the Scottish Ministers in October 2014 for Seagreen Alpha and Seagreen Bravo Offshore Wind Farms (OWFs). The S36 consents were varied by the Scottish Ministers pursuant to an application under s36C of the Electricity Act 1989 on 28 August 2018 and the S36 Consent applicable to the Bravo Offshore Wind Farm was assigned to SAWEL on 22 November 2019. Marine Licences for Seagreen Alpha and Bravo OWFs and the Offshore Transmission Asset (OTA) (together the 'Marine Licences') were also awarded by the Scottish Ministers in October 2014 under the Marine (Scotland) Act 2010 and the Marine and Coastal Access Act 2009. Together the wind farms Seagreen Alpha and Seagreen Bravo and the OTA collectively comprise 'the Seagreen Project'.

In 2018, following application by Seagreen, the Alpha Marine Licence and Bravo Marine Licence were varied by Scottish Ministers. Subsequently, in 2019, the OTA Marine Licence was also varied by Scottish Ministers. In addition, an additional ML was granted in 2019, and subsequently varied on 24 February 2020 and 18 August 2021, providing an alternative landfall cable installation method. On 12 December 2019, the Bravo Marine Licence was transferred from the name of Seagreen Bravo Wind Energy Limited (SBWEL) into the name of Seagreen Alpha Wind Energy Limited (SAWEL).

1.2 Project Description

The Seagreen Project is located in the North Sea, in the outer Firth of Forth and Firth of Tay region and comprises the OWFs (the wind turbine generators (WTGs), their foundations, associated array cabling and WTG to OSP cables), together with associated infrastructure of the OTA (Offshore Substation Platforms (OSPs), their foundations and the offshore export cable), to facilitate the export of renewable energy to the national electricity transmission grid. The location of the Seagreen Project is shown in Figure 1.1.

The Seagreen Project will consist of the following key components:

- 150 WTGs;
 - 114 WTGs installed on three-legged steel jackets, each installed on suction bucket caissons;
 - 36 WTGs installed on up to four-legged steel jackets, each installed on pin pile foundations;
- Two OSPs, each installed on up to 12 pin pile foundations;
- A network of inter-array subsea cables as detailed below, inter array cables will be buried where possible and where burial is not possible cable protection will be provided.
 - Circa 300km of inter-array cables to connect strings of WTGs on suction bucket caissons together and to connect these WTGs to the OSPs
 - Circa 55km of inter array cables to connect strings of WTGs on piled foundations together and to connect these WTG to the OSPs; and

- Circa 3km of interconnector cable to connect the two OSPs
- Three subsea export cables, totalling circa 190km in length, to transmit electricity from the OSP to the landfall at Carnoustie and connecting to the onshore export cables for transmission to the onshore substation and connection to the National Grid network. Export cables will be buried where possible and where burial is not possible cable protection will be provided.

Installation of the WTGs will be phased, with Stage 1 covering installation of the 114 WTGs on suction bucket caisson jacket foundations with associated array cabling, and Stage 2 covering installation of the 36 WTGs on piled jacket foundations with associated array cabling. Installation of the OSPs will also be phased with one OSP (foundations and topsides) installed in Stage 1, and the second OSP (foundations and topsides) installed in Stage 2.

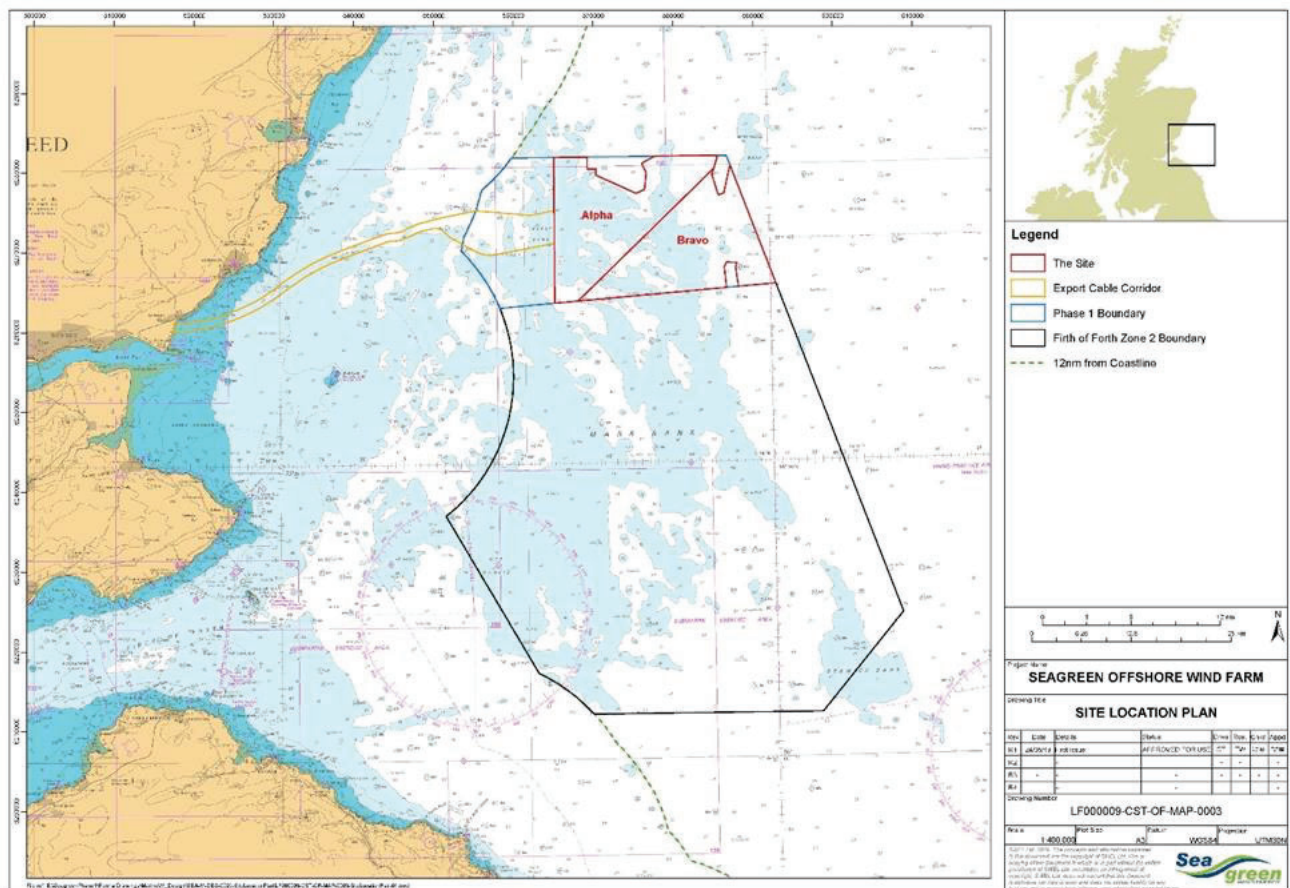


Figure 1.1 – Seagreen Project Location

1.3 Consent and Licence Requirements

This CoP has been prepared to discharge condition 9 of the S36 Consents, condition 3.2.2.3 of the OTA Marine Licence and condition 3.1.1 of the Landfall Alternative Cable Installation Marine Licence, as set out in Table 1.1.

Table 1.1: Consent Conditions to be discharged by this CoP

Consent Document	Condition Reference	Condition Text	Reference to the relevant Section of the CoP
Section 36	Condition 9	The Company must, no later than 6 months prior to the Commencement of the [Wind Farms], submit a Construction Programme ("CoP"), in writing, to the Scottish Ministers for their written approval.	Revision 05 of the CoP was approved by Scottish Ministers on 26 October 2021. This document sets out the revised CoP for approval by the Scottish Ministers
		Such approval may only be granted following consultation by the Scottish Ministers with the JNCC, SNH, SEPA, MCA, NLB, RSPB Scotland, the Planning Authority and any such other advisors or organisations as may be required at the discretion of the Scottish Ministers.	Consultation with all required parties was undertaken prior to the approval of Rev 05. Additional consultation required in relation to Rev 06 will be at the discretion of Scottish Ministers.
		The [Wind Farms] must, at all times, be constructed in accordance with the approved CoP (as updated and amended from time to time by the Company).	Section 1.4 and 2
		Any updates or amendments made to the CoP by the Company must be submitted, in writing, by the Company to the Scottish Ministers for their written approval.	Section 1.4
		The CoP must set out: a) The proposed date for Commencement of [the Wind Farms]; b) The proposed timings for mobilisation of plant and delivery of materials, including details of onshore lay-down areas; c) The proposed timings and sequencing of construction work for all elements of the [Wind Farm] infrastructure; d) Contingency planning for poor weather or other unforeseen delays; and e) The scheduled date for Final Commissioning of the [Wind Farms].	Sections 3, 4 and 6
OTA Marine Licence	3.2.2.3	The Licensee must, no later than 6 months prior to the Commencement of the [OTA], submit a CoP, in writing, to the Licensing Authority for their written approval.	Revision 05 of the CoP was approved by Scottish Ministers on 26 October 2021. This document sets out the revised CoP.

Consent Document	Condition Reference	Condition Text	Reference to the relevant Section of the CoP
		Such approval may only be granted following consultation by the Licensing Authority with the MOD, the JNCC, SNH, SEPA, MCA, NLB, Angus Council, Carnoustie Golf Links Management Committee ("CGLMC") and any such other advisors or organisations as may be required at the discretion of the Licensing Authority.	Consultation with all required parties was undertaken prior to the approval of Rev 05. Additional consultation required in relation to Rev 06 will be at the discretion of Scottish Ministers.
		The CoP must be in accordance with the Application.	Section 7
		<p>The CoP must set out:</p> <p>a) The proposed date for Commencement of the [OTA];</p> <p>b) The proposed timings for mobilisation of plant and delivery of materials, including details of onshore lay-down areas;</p> <p>c) The proposed timings and sequencing of construction work for all elements of the [OTA] infrastructure;</p> <p>d) Contingency planning for poor weather or other unforeseen delays;</p> <p>e) The scheduled date for Final Commissioning of the [OTA]; and</p> <p>f) A communications protocol must be developed between the applicant and MOD Barry Buddon Firing Range.</p>	<p>Section 3, 5 and 6</p> <p>Appendix D: MOD Barry Buddon Firing Range Communications Protocol sets out the Communications Protocol (part f) which has been agreed with the MOD</p>
Alternative Landfall Marine Licence	3.1.1	The Licensee must ensure that, where the Works authorised by the licence are carried on as an alternative to nearshore cable laying operations under marine licence number 04678/14/0, that the works authorised by the licence are appropriately covered in the plans submitted under marine licence number 04678/14/0. Such plans include the CoP, as required by condition 3.2.2.3 of marine licence number 04678/19/0.	Section 3

1.4 Change Management Process

Should any updates to this CoP become necessary, the change management process for any updates required to the CoP including resubmission of consent plans for approval, is outlined in Appendix B – The CoP Change Management Procedure.

2. Scope and Objectives of the CoP

This CoP has been prepared to address the specific requirements of the relevant conditions attached to the S36 Consents and Marine Licences (collectively referred to as ‘the consents’) issued to Seagreen Wind Energy Limited (Seagreen) and applies to all construction as required to be undertaken before the Final Commissioning of the Works.

The overall aims and objectives of the CoP are to set out the proposed timings and programming of construction of the Seagreen Project (as defined in Section 1.1). The CoP includes:

- a) The proposed date for commencement of construction;
- b) The proposed details of mobilisation of plant and delivery of materials;
- c) The proposed timings and sequencing of construction of all elements of the OWFs and OTA;
- d) Contingency planning for poor weather or other delays; and
- e) The proposed date for final commissioning of the development.

All Seagreen personnel and Seagreen’s Contractors (including their Sub-Contractors) involved in the Seagreen Project must comply with the CoP.

3. Construction Programme Overview

3.1 Introduction

This section of the CoP provides a brief overview of the Seagreen Project (as consented under the S36 Consents and Marine Licences) and presents the key milestone dates for:

- the commencement and duration of works;
- the key construction activities; and
- the commissioning of the wind farm.

Sections 4 and 5 provide specific details of the construction programme for the OWFs and OTA, respectively. Section 6 details contingency planning for the OWFs and OTA. The full construction programme is provided in Appendix C: Construction Programme.

Construction commenced in 2020, with completion in 2023. Delivery of the project is phased with construction taking place in two stages: Stage 1 and Stage 2.

Stage 1 of the OWF covers the installation of the 114 WTGs on suction bucket caisson jacket foundations with associated inter array cabling and Stage 2 covers installation of the 36 WTGs on piled jacket foundations with associated inter array cabling.

Installation of the OTA will also be phased with Stage 1 covering export cable installation at landfall, and installation of the first OSP (foundations and topsides), OSP interconnection cable, and subtidal export cables; and Stage 2 covering installation of the second OSP (foundations and topsides) Stage 2 OTA works will coincide with Stage 2 OWF construction works.

There will be approximately a five-month gap in construction between Nov 2022 (end of WTG installation in Stage 1) and April 2023 (start of piling operations in Stage 2). During this gap, some WTGs on suction buckets may be commissioned and begin generating in Stage 1, following installation of the first OSP.

It is currently anticipated that within Stage 1 and Stage 2 the offshore construction works will be carried out year-round and around the clock (i.e. 24 hours working, 7 days a week).

3.2 Key Milestone Dates

Table 3.1 below presents to key construction milestone dates for the Seagreen Project (see also Appendix C: Construction Programme).

Table 3.1 Summary of key milestone dates

Milestone	Anticipated Programme
Seagreen Project	
Commencement of Seagreen project construction (triggered by commencement of licensable works at landfall)	December 2020
Seagreen OWF (Licensable activities under S36 consent and OWF Marine Licence)	
Mobilisation of plant and delivery of materials to onshore laydown areas (where required)	To match installation timings as set out below
Timing and sequencing of construction work <i>Stage 1</i>	<p>Pre-Campaign Surveys and Subtidal Seabed Preparation (subject to a separate marine licence)</p> <ul style="list-style-type: none"> April 2021 – May 2022 <p>Site Establishment (subject to separate marine licence exemption) now complete</p> <p>Pre-Lay Grapple Run</p> <ul style="list-style-type: none"> November 2021 – November 2022 <p>WTG Jacket Suction Bucket Substructures installation:</p> <ul style="list-style-type: none"> October 2021 – September 2022

Milestone	Anticipated Programme
	Inter-array Cables installation: <ul style="list-style-type: none"> November 2021– November 2022 WTG installation <ul style="list-style-type: none"> November 2021 –November 2022
Timing and sequencing of construction work <i>Stage 2</i>	WTG Piled Foundation Substructures: <ul style="list-style-type: none"> Pile installation April 2023 – July 2023 Jacket installation on to piles: July 2023 – September 2023 Inter-array Cables installation (including Pre-Lay Grapnel Run): <ul style="list-style-type: none"> August 2023 – October 2023 WTG installation <ul style="list-style-type: none"> September 2023 – November 2023
Final Commissioning of Wind Farm	November 2023
OTA (Transmission Asset Marine Licence / Alternative Cable Installation Marine Licence)	
Mobilisation of plant and delivery of materials	To match installation timings as set out below
Timing and sequencing of construction work <i>Stage 1</i>	Pre-Campaign Surveys and Subtidal Seabed Preparation (subject to a separate marine licence) now complete Landfall Installation from -2.5 m LAT water depth to Mean High Water Springs <ul style="list-style-type: none"> December 2020 – April 2022 Pre-Lay Grapnel Run <ul style="list-style-type: none"> Completed October 2021 – (All Export Cables) OSP Jacket Foundation Substructure installation <ul style="list-style-type: none"> November 2021 – December 2021 OSP Topside installation <ul style="list-style-type: none"> January 2022 – February 2022 Subtidal Export Cable installation <ul style="list-style-type: none"> December 2021 – April 2022 (All Export Cables)

Milestone	Anticipated Programme
	<ul style="list-style-type: none"> •
Timing and sequencing of construction work Stage 2	OSP Interconnector Cable installation <ul style="list-style-type: none"> • May 2023 OSP Jacket Foundation Substructure installation <ul style="list-style-type: none"> • May 2023 – August 2023 OSP Topside installation <ul style="list-style-type: none"> • May 2023 – August 2023
Final Commissioning of OTA	November 2023

4. Wind Farm Construction Programme

4.1 Introduction

The Seagreen Project construction programme is set out in Appendix C. The following sections 4.2 to 4.5 provide details in relation to the Seagreen Project programme as required by the consent condition.

Construction of the OWFs will occur in two stages. Stage 1 will cover installation of up to 114 WTGs on suction bucket caisson foundations, and installation of the first OSP. Stage 2 will cover installation of up to 36 WTGs with piled foundations, and installation of the second OSP. There is potential that WTGs on suction buckets may be commissioned and begin generating in Stage 1 after installation of the OSP.

4.2 Commencement of the Wind Farm Construction

The S36 Consents define the commencement of construction of the Wind Farm as:

“the date on which Construction begins on the site of the [Wind Farm] in accordance with this consent.”

Seagreen proposes to licence the deployment of construction buoys to demarcate the wind farm site area separately and therefore commencement of construction for the OWF is defined as the installation of the wind turbine foundations in October 2021. This approach was set out and agreed with MS-LOT on 06 October 2020. The Seagreen Project has reached financial close, and orders have been placed and fabrication has commenced for components of the Seagreen Project required early in the construction process, or those with long lead in times, including the WTGs.

The delivery and stockpiling of materials and onshore fabrication activities to facilitate construction of the Seagreen Project has commenced, as shown in the programme in Appendix C and discussed below in section 4.4.

4.3 Pre-Campaign Surveying and Subtidal Seabed Preparation

Seabed preparation activities will be required in advance of foundation installation activities and inter-array cable installation activities, further information is provided in the OWF CMS (LF000009-CST-OF-MST-0001).

Pre-campaign surveys and seabed preparation activities will take place between April 2021 and May 2022. These activities are covered by separate Marine Licences, as required.

Further seabed preparation activities may be required in advance of Stage 2 construction; however, this is still to be confirmed and may be subject to a separate Marine Licence depending on the extent to which these activities involve licensable marine activities.

4.4 Mobilisation of Plant, Delivery of Materials, use of Onshore Laydown Areas, and Timing and Sequencing of Construction Work

The key components of the OWFs are:

- WTG jacket suction bucket substructures;
- WTG piled foundation substructures;
- Inter-array cabling; and
- Wind turbine generators.

Delivery of main components (as set out above) will be directly to the OWF site from the location of fabrication and is likely to be by sea transport. Exceptions to this are:

- Jacket suction bucket substructures - will be assembled onshore at the Jacket Assembly Port (JAP) in Nigg, prior to being transported offshore; and
- WTGs - will be delivered to the assembly port (Able Seaton) prior to being assembled and transported offshore.

The following section details the proposed mobilisation of plant, delivery of materials, and timings and sequencing of construction work for all elements of the OWFs (see Appendix C: Construction Programme).

4.4.1 WTG Jacket Suction Bucket Substructures Manufacture, Supply and Installation

Suction bucket caisson and jacket fabrication commenced in August 2020. The transition piece will be attached to the jacket in the fabrication yard prior to transport to the JAP. The jacket and suction bucket caissons will be transported to the JAP between June 2021 and August 2022.

The assembled WTG jacket suction bucket substructures are expected to be stored at the fabrication location and transported directly to site via transport vessels as required during the installation process.

WTG jacket suction bucket substructures will be installed during Stage 1 as per the timings set out in Table 3.1. Installation methods are set out in the OWF CMS (LF000009-CST-OF-MST-0001) (see Table 1.2)

4.4.2 WTG Piled Foundations Substructures Manufacture, Supply and Installation

Piles will be transported to the wind farm site directly from the fabrication location and as required during the installation process.

Piled jacket fabrication will commence in April 2022. The jacket sub-structures are expected to be stored at the fabrication location and transported directly to site as required during the installation process.

Pile installation is planned to take place in a single phase in Stage 2. Jacket sub-structures will then be installed on to pre-installed piles. These activities will occur as per the timings set out in Table 3.1. Further information on installation methods is set out in the OWF CMS (LF000009-CST-OF-MST-0001) (see Table 1.2).

4.4.3 Inter-array Cables Manufacture, Supply and Installation

Delivery of cables will be phased to match installation requirements and therefore will be delivered to site over the period October 2021 to November 2022 (for Stage 1). The cables are expected to be transported directly to site from the manufacturing facility.

Prior to installation of the inter-array cables, a pre-lay grapnel run (PLGR) will be undertaken to clear the cable route of any remaining obstructions.

PLGR and installation of the inter-array cables is scheduled to take place as per the timings set out in Table 3.1.

WTGs will be connected to the inter-array cables during the Stage 1 and Stage 2 WTG installation windows, as per timings set out in Table 3.1.

4.4.4 WTG Manufacture, Supply and Installation

WTG delivery from the manufacturing facilities to the onshore laydown areas are scheduled from July 2021 until July 2022. Onshore pre-assembly and pre-commissioning of WTGs will take place at the onshore laydown areas. The delivery schedule of WTGs to the laydown areas is six months ahead of the installation of the WTGs.

Installation and commissioning of the WTGs is scheduled as per the timings set out in Table 3.1.

4.5 Final Commissioning of the Wind Farm

Annex 3 of the S36 Consents defines the Final Commissioning stage of the Seagreen Alpha and Seagreen Bravo OWFs as:

“the date on which all wind turbine generators forming the [Wind Farm] have supplied electricity on a commercial basis to the National Grid, or such earlier date as the Scottish Ministers deem the [Wind Farm] to be complete.”

It is anticipated that WTGs on suction buckets may be commissioned and begin generating at the end of Stage 1, prior to installation of the 36 WTGs with piled foundations and the second OSP in Stage 2. Stage 2 will be commissioned over a three-month period between September 2023 and November 2023.

Therefore, the anticipated date of Final Commissioning of the Seagreen Project is scheduled to be November 2023.

5. Offshore Transmission Asset Construction Programme

5.1 Introduction

The Seagreen Project construction programme is set out in Appendix C. The following sections 5.2 to 5.5 provide details in relation to the OTA as required by the consent condition.

5.2 Commencement of OTA

The Commencement of the OTA as defined by the Marine Licence is:

“the date on which the first vessel arrives on the Site to begin carrying on the Licensable Marine Activity in connection with the construction of the [OfTW], as described in Part 2 of this licence.”

The first licensable works at landfall will be undertaken in December 2020. It is noted that vessels will not be involved in these activities, however, for the purposes of this document, the Commencement of the OTA is considered to be December 2020.

The Seagreen Project has reached financial close, and orders have been placed for components of the OTA required early in the construction process, or those with long lead in times, including, for example, the export cable and steel for OSP fabrication.

5.3 Pre-Campaign Surveys and Subtidal Seabed Preparation

Seabed preparation activities will be required in advance of OSP foundation installation activities and export cable installation activities (further information is provided in the OTA CMS (LF000009-CST-OF-MST-002)).

Pre-campaign surveys and seabed preparation activities for the export cable corridors were undertaken between June 2020 and August 2020. Stage 1 OSP seabed preparation activities were completed in 2021.

Further seabed preparation activities may be required in advance of Stage 2 construction; however, this is still to be confirmed and would be subject to a separate Marine Licence depending on the extent to which these activities involve licensable marine activities.

5.4 Mobilisation of Plant, Delivery of Materials, use of Onshore Laydown Areas, and Timing and Sequencing of Construction Works

The key components of the offshore OTA are:

- Three subtidal export cables;
- Two OSPs; and
- OSP interconnector cable.

This CoP also includes export cable installation activities from MHWS at the landfall to a depth of 2.5M LAT under Marine Licence 07050/20/0 (as varied), as described below. From MHWS, works will continue offshore under the OTA Marine Licence 04678/19/0.

The arrival of the plant required to install the offshore OTA components will be timed to coincide with the timing of installation activities, as set out in Table 3.1 above.

All elements of the offshore OTA infrastructure will be delivered directly to site from the location of fabrication as required; no onshore laydown areas will therefore be required for the completion of the offshore OTA installation process.

The following section details the proposed mobilisation of plant, delivery of materials, and timings and sequencing of construction work for all elements of the OTAs (see Appendix C: Construction Programme). Further details of installation methods can be found in the OTA CMS (LF000009-CST-OF-MST-002).

5.4.1 Landfall Installation from -2.5 m LAT Water Depth up to MHWS

Export cable installation activities at landfall will consist of open cut trenching under Marine Licence 07050/20/0 Further information is included in the OTA CMS (LF000009-CST-OF-MST-002).

Landfall installation will occur as per the timings set out in Table 3.1.

5.4.2 OSP Jacket Foundation Substructure Manufacture, Supply and Installation

Fabrication of OSP jacket foundation substructures commenced in June 2020. They will be delivered to site for immediate installation.

The first OSP jacket foundation substructure will be assembled and installed at site as per timings set out in Table 3.1. The second OSP jacket foundation substructure will be installed over a four-month period between May 2023 and August 2023, coinciding with pile installation and jacket installation for the WTG jacket substructures (see Table 3.1).

The jackets will be lifted from the supply vessel, positioned and lowered to the seabed. The piles will then be lifted and inserted into pile sleeves attached to the foot of each jacket leg and driven into the seabed.

5.4.3 OSP Topside Manufacture, Supply and Installation

Fabrication of OSP topsides commenced in April 2020. They will be delivered to site for immediate installation.

The first OSP topside will be installed in Stage 1 between January 2022 and February 2022, and the second OSP topside will be installed in Stage 2 between May 2023 and August 2023 (see Table 3.1).

5.4.4 OSP Interconnector Cable Manufacture, Supply and Installation

Delivery of the OSP interconnector cable will match installation requirements as set out in Table 3.1. The cable is expected to be transported directly to site from the manufacturing facility.

The cable route will firstly be cleared of any remaining obstructions by undertaking a pre-lay grapnel run (PLGR) followed by a pre-lay survey by May 2023.

The OSP interconnector cable will then be installed as per timings set out in Table 3.1. The cable will be trenched and buried, with cable protection installed if necessary.

5.4.5 Subtidal Export Cable Manufacture, Supply and Installation

Subtidal export cable delivery will be phased to match installation requirements and will be delivered directly to the project site from the manufacturing facility.

Prior to subtidal export cable installation, a pre-lay grapnel run will be undertaken for each circuit as per the timings set out in Table 3.1

Subtidal export cables will be installed in three separate circuits for Stage 1 as per the timings set out in Table 3.1.

5.5 Final Commissioning of the OTA

The OTA Marine Licence (Section 1.1(n)) defines the Final Commissioning of the OTA as:

“the date on which all the [OTA] have been used to supply electricity on a commercial basis to the National Grid, or such earlier date as the Licensing Authority deem the [OTA] to be fully commissioned.”

The proposed date for the Final Commissioning of the OTA is November 2023 as this is the date that electricity from all WTGs will be exported via the OTA to the grid on a commercial basis.

6. Contingency Planning

Given the nature and scale of the construction project, the potential exists for unforeseen delays, including from periods of unsuitable weather and equipment failure which are out with SWEL's control.

SWEL has undertaken weather analysis and assessed programme risks; the construction programme set out in Appendix C has been designed with contingencies included. The programme includes, on average, a 30% contingency allowance.

7. Compliance with the Environmental Statement (ES) ES Addendum

The relevant conditions of the S36 Consents and the Marine Licences require that the Seagreen Project be constructed in accordance with the ES, ES Addendum and Environmental Report (with reference to the alternative cable installation Marine Licence). These documents did not set out any commitments with regards to the construction programme, however they did set out an indicative construction programme. This indicative programme:

- Set out the anticipated maximum duration of construction of the Seagreen Project and key elements of construction activity;
- Assumed that construction activities will not take the full duration shown against each activity; and
- Assumed that installation of substructures and foundations would not take longer than three years in total, with work undertaken between April and September each year and total construction duration of 18 months within this three-year period.

Table 7.1 presents the indicative 4- year construction programme set out within the ES. The original table included in the ES was based upon achieving consent in 2013, with the activities below taking place between Q4 2015 and Q4 2019. The grey shading shows the indicative timing and duration of activities presented in the ES for the purposes of impact assessment. The green shading represents the timings/durations for the programme presented in this CoP.

Table 7.1 indicates that the key construction works for the Seagreen Project generally lie within the relative timings and durations set out within the indicative programme as presented in the ES. In all cases, the duration of the key construction activities is less than the total durations suggested in the ES and the total duration of the programme as set out in this CoP is less than anticipated within the original ES.

Table 7.1: ES Indicative Construction Programme Years 1 to 5 (with current construction years below -grey shading) relative to the timings set out in this CoP (green shading)

Construction Activity	Year 1 (2019)				Year 2 (2020)				Year 3 (2021)				Year 4 (2022)				Year 5 (2023)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Installation of export cables (from MHWS to project areas inc. landfall)																				
Offshore foundations / substructure installation																				
Array cable installation																				
Installation of turbines and offshore platforms																				
Project completion																				

The timings for installation of the export cables and inter array cables presented in this CoP lie beyond what was presented in the ES, however, the duration of activity is much shorter in comparison to the ES, which is

due to the phased installation approach. Therefore, the durations presented in this CoP in relation to the export cable installation are in accordance with the ES, ES Addendum and Application.

Based on the above, the CoP is considered to be in accordance with the ES, ES Addendum and Application.

8. References

Table 8.1 Seagreen Document References

SWEL Document Number	Title
LF000009-CST-OF-MST-0001	Offshore Wind Farm Construction Method Statement
LF000009-CST-OF-MST-0002	Offshore Transmission Asset Construction Method Statement

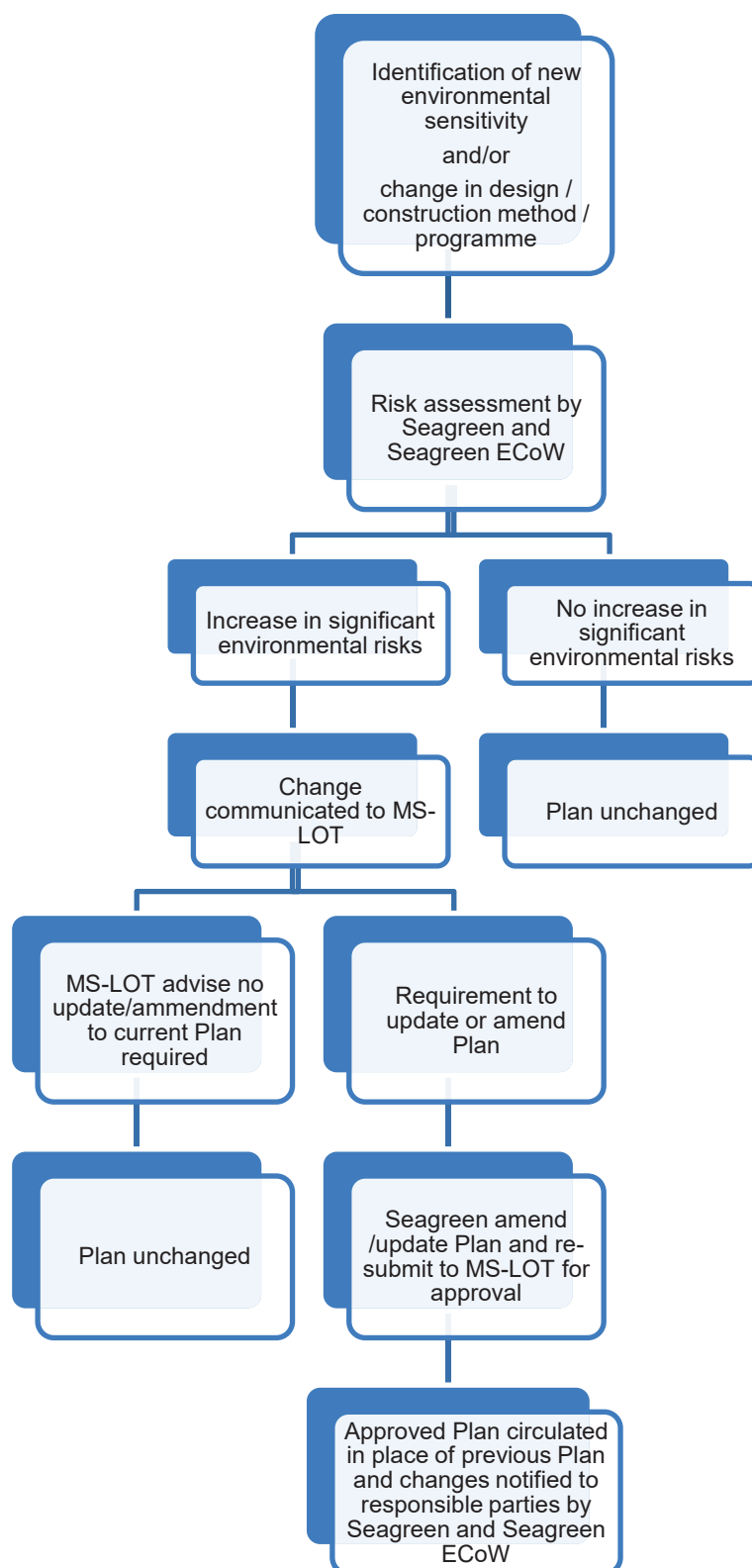
Appendix A – CoP List of Abbreviations and Definitions

Term	Description
Alpha Marine Licence	Marine licence granted by the Scottish Ministers under the Marine (Scotland) Act 2010 and the Marine and Coastal Access Act 2009 in respect of Seagreen Alpha Wind Farm on 10 October 2014 as amended by the revised marine licence granted by the Scottish Ministers on 28 August 2018 (reference 04676/18/0) and as further amended by the revised marine licence granted by the Scottish Ministers on 12 December 2019 (reference 04676/19/0)
Bravo Marine Licence	Marine licence granted by the Scottish Ministers under the Marine (Scotland) Act 2010 and the Marine and Coastal Access Act 2009 in respect of Seagreen Bravo Wind Farm on 10 October 2014 as amended by the revised marine licence granted by the Scottish Ministers on 28 August 2018 (reference 04677/18/0) and as further amended by the revised and transferred marine licence granted by the Scottish Ministers on 12 December 2019 (reference 04677/19/0)
CGLMC	Carnoustie Golf Links Management Committee
CMS	Construction Method Statement as required under Alpha and Bravo Section 36 Condition 10 and the Offshore Transmission Asset Marine Licence Condition 3.2.2.4
(the) consents	Collective term used to describe the Section 36 consents and Marine Licences issued to SAWEL, SBWEL and SWEL
Contractor	A contractor as appointed by SWEL
CoP	Construction Programme as required under Alpha and Bravo Section 36 Condition 9 and the Offshore Transmission Asset Marine Licence Condition 3.2.2.3
ECow	Ecological Clerk of Works as required under Alpha and Bravo Section 36 Condition 29 and the OTA Marine Licence Condition 3.2.2.12.
ES	Environmental Statement
FID	Final Investment Decision
HDPE	High density polyethylene
JAP	Jacket Assembly Port
JNCC	Joint Nature Conservation Committee
Landfall	The point above MHWS where the OTA export cables connect to the OnTW
LAT	Lowest Astronomical Tide
Licensing Authority	Marine Scotland acting on behalf of the Scottish Ministers
Licensee	Seagreen Wind Energy Ltd (Seagreen), a company with number 06873902 and having its registered office at No1 Forbury Place, 43 Forbury Road, Reading, United Kingdom RG1 3JH, on behalf of SAWEL in respect of the OWF and on behalf of SAWEL and SBWEL in respect of the OTA.

Term	Description
Marine Licences	The three marine licences for the Seagreen Project, comprising the Alpha Marine Licence, the Bravo Marine Licence and the OTA Licence
MCA	Maritime and Coastguard Agency
MHWS	Mean High Water Springs
MOD	Ministry of Defence
MS-LOT	Marine Scotland Licensing and Operations Team
NLB	Northern Lighthouse Board
OnTW	Onshore Transmission Works, from landfall consisting of onshore buried export cables and new transmission substation
OTA	Offshore Transmission Asset, comprising the OSPs and the transmission cable required to connect the Wind Farm Assets to the OnTW from the OSPs to the MHWS at the landfall at Carnoustie
OTA Marine Licence	marine licence granted by the Scottish Ministers under the Marine (Scotland) Act 2010 and the Marine and Coastal Access Act 2009 in respect of the OTA on 10 October 2014 as amended by the revised marine licence granted by the Scottish Ministers on 6 March 2019 (reference 04678/19/0)
OSP	Offshore Substation Platform means an alternating current Offshore substation platform which is a standalone modular unit that utilises the same substructure and foundation design as a wind turbine generator
OWF	Collective term used to describe the Wind Farm Assets and OTA
PLGR	Pre-lay grapnel run
S36 Consents	Consent under section 36 of the Electricity Act 1989 granted by the Scottish Ministers on 10 October 2014 in respect of the Seagreen Alpha and Seagreen Bravo offshore wind farms, both as varied by the Scottish Ministers by decision letter issued pursuant to an application under section 36C of the Electricity Act 1989 on 28 August 2018
SAWEL	Seagreen Alpha Wind Energy Limited, a company with registered number 07185533 and having its registered office at No1 Forbury Place, 43 Forbury Road, Reading, United Kingdom RG1 3JH
SBWEL	Seagreen Bravo Wind Energy Limited, a company with registered number 07185543 and having its registered office at No1 Forbury Place, 43 Forbury Road, Reading, United Kingdom RG1 3JH
SEPA	Scottish Environmental Protection Agency
Site	The area outlined in red in both Figure 1 attached to the S36 consents Annex 1 and the figure contained in Part 4 of the Marine Licence
SNH	Scottish Natural Heritage

Term	Description
Seagreen (SWEL)	Seagreen Wind Energy Limited (SWEL), the parent company of Seagreen Alpha Wind Energy Ltd (SAWEL) and Seagreen Bravo Wind Energy Ltd (SBWEL), (company number 06873902) and having its registered office at No.1 Forbury Place, 43 Forbury Road, Reading, United Kingdom, RG1 3JH
WTG	Wind turbine generator

Appendix B – The CoP Change Management Procedure



Appendix C: Construction Programme

	Stage 1												Stage 2																										
	2019				2020								2021								2022								2023										
	Oct	Nov	Dec	Q4	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Fabrication & Assembly:																																							
Suction bucket foundation jackets																																							
WTG piled foundation jackets																																							
WTGs																																							
OSP jacket foundation substructures																																							
OSP topsides																																							
Pre-Campaign Surveys and Subtidal Seabed Preparation (subject to separate ML)																																							
Offshore Site Establishment																																							
Offshore Wind Farm (OWF):																																							
Suction bucket jacket substructures installation																																							
Inter-Array Cable installation																																							
Pile installation																																							
Piled foundation jacket substructures installation																																							
WTG installation and commissioning																																							
Offshore Transmission Asset (OTA):																																							
Works at Landfall																																							
Pre-Lay Grapple Run																																							
OSP jacket foundation substructures installation																																							
OSP topside installation and commissioning																																							
OSP interconnector cable installation																																							
Subtidal Export cable installation																																							
Full electricity generation																																							



Key:
Key dates
Pre-Campaign Surveys
Fabrication and Assembly of Key Components
Stage 1 OWF and OTA Construction Activities
Stage 2 OWF and OTA Construction Activities

Appendix D: MOD Barry Buddon Firing Range Communications Protocol

Project Title	Seagreen Offshore Wind Farm
Document Reference Number	LF000009-CST-OF-RPT-0012

Barry Buddon Firing Range Complex: MOD Communications Protocol

Submitted in support of Marine Licence Condition 3.2.2.3(f)

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Defined Terms

Term	Definition
Firing Range	Designated zone in which a direct fire weapon system is located and within which it is authorised to be fired. A firing range is generally comprised of a number of firing lanes in parallel.
Danger Area	Space in which there may be a hazard which could result in a risk to personnel, equipment or property. Encroachment into such an area by land, sea or air would be likely to cause damage, death or injury to personnel and/or equipment.
Seagreen Project	Seagreen Alpha and Seagreen Bravo Offshore Wind Farms and the Offshore Transmission Assets
Communications Protocol (the Protocol)	The document developed by Seagreen in consultation with the MOD, as required by condition 3.2.2.3(f) of the Offshore Transmission Asset Marine Licence.

1. Introduction

1.1 Project Background

Seagreen Wind Energy Limited (SWEL), (hereafter referred to as Seagreen) was granted Section 36 Consents (S36 Consents) under the Electricity Act 1989 by Scottish Ministers in October 2014 for Seagreen Alpha and Seagreen Bravo Offshore Wind Farms (OWFs), as varied. Marine Licences for Seagreen Alpha and Bravo OWFs and the Offshore Transmission Asset (OTA) (together the 'Marine Licences') were also granted by Scottish Ministers in October 2014, as varied, under the Marine (Scotland) Act 2010 and the Marine and Coastal Access Act 2009 (together the 'Marine Licences'). Seagreen Alpha and Seagreen Bravo Offshore Wind Farms (OWFs) and the OTA are collectively referred to as the 'Seagreen Project'.

In 2018, following application by Seagreen, the Alpha OWF Marine Licence and Bravo OWF Marine Licence were varied by the Scottish Ministers, following application by Seagreen in 2019 these licences were subsequently varied. In 2019, the OTA Marine Licence was also varied by the Scottish Ministers. In 2019, the Bravo Marine Licence was assigned from Seagreen Bravo Wind Energy Limited (SBWEL) to Seagreen Alpha Wind Energy Limited (SAWEL).

The consented offshore elements of the Seagreen Project consist of the following components:

- 150 WTGs comprising;
 - 114 WTGs installed on three legged steel jackets, each installed on suction bucket caissons;
 - 36 WTGs installed on up to four legged steel jackets, each installed on pin pile foundations;
- Two Offshore Substation Platforms (OSPs), each installed on up to 12 pin pile foundations;
- A network of inter-array subsea cables as detailed below:
 - Circa 300km of inter-array cables to connect strings of WTGs on suction bucket caissons together and to connect these WTGs to the OSP;
 - Circa 55km of inter-array cables to connect strings of WTGs on piled foundations together and to connect these WTGs to the OSP;
 - Circa 3km of interconnector cable to connect the two OSPs;
 - Inter-array cables will be buried where possible and where burial is not possible cable protection will be provided.
- Three subsea export cables, totalling circa 190km in length, to transmit electricity from the OSPs to the landfall at Carnoustie and connecting to the onshore export cables for transmission to the onshore substation and connection to the National Grid network. Export cables will be buried where possible and where burial is not possible cable protection will be provided.

The export cables make landfall at Carnoustie and onshore cables run approximately 19km onshore to the substation at Tealing. The Onshore Transmission Asset (OnTA) was subject to a separate planning application under the Town and Country Planning (Scotland) Act 1997. This was awarded by Angus Council in 2013 and extended in 2016 following reapplication by Seagreen.

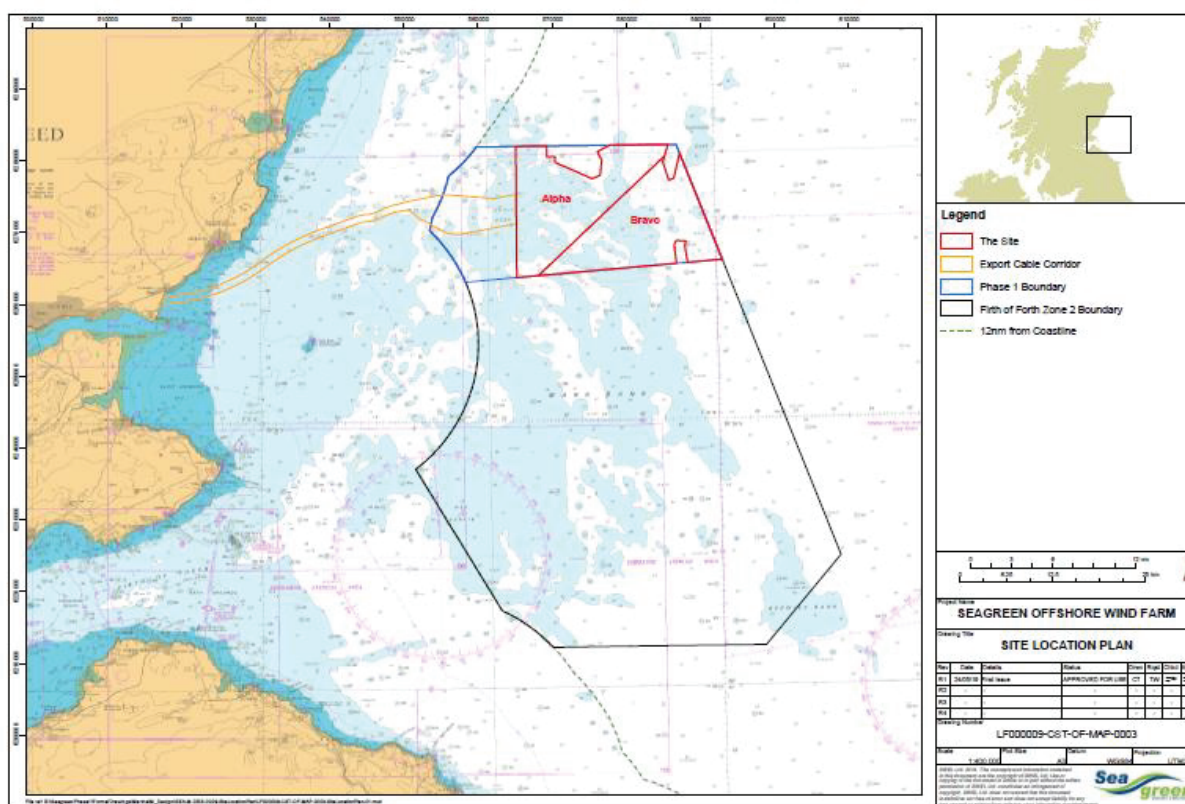


Figure 1. Seagreen Alpha, Seagreen Bravo and export cable project boundaries

1.2 Barry Buddon Range Danger Area Interaction

During the determination phase of the Seagreen Project consenting process, the Ministry of Defence (MOD) raised concerns, but no objection to consent, with regard to the export cable route and its passage through the Barry Buddon Range Danger Area (the Danger Area).

The export cable corridor for the project overlaps with the Danger Area and the firing ranges it contains. The corridor also overlaps with the northern section of the Civil Aviation Authority (CAA) Air Danger Area (D604) (Figure2).

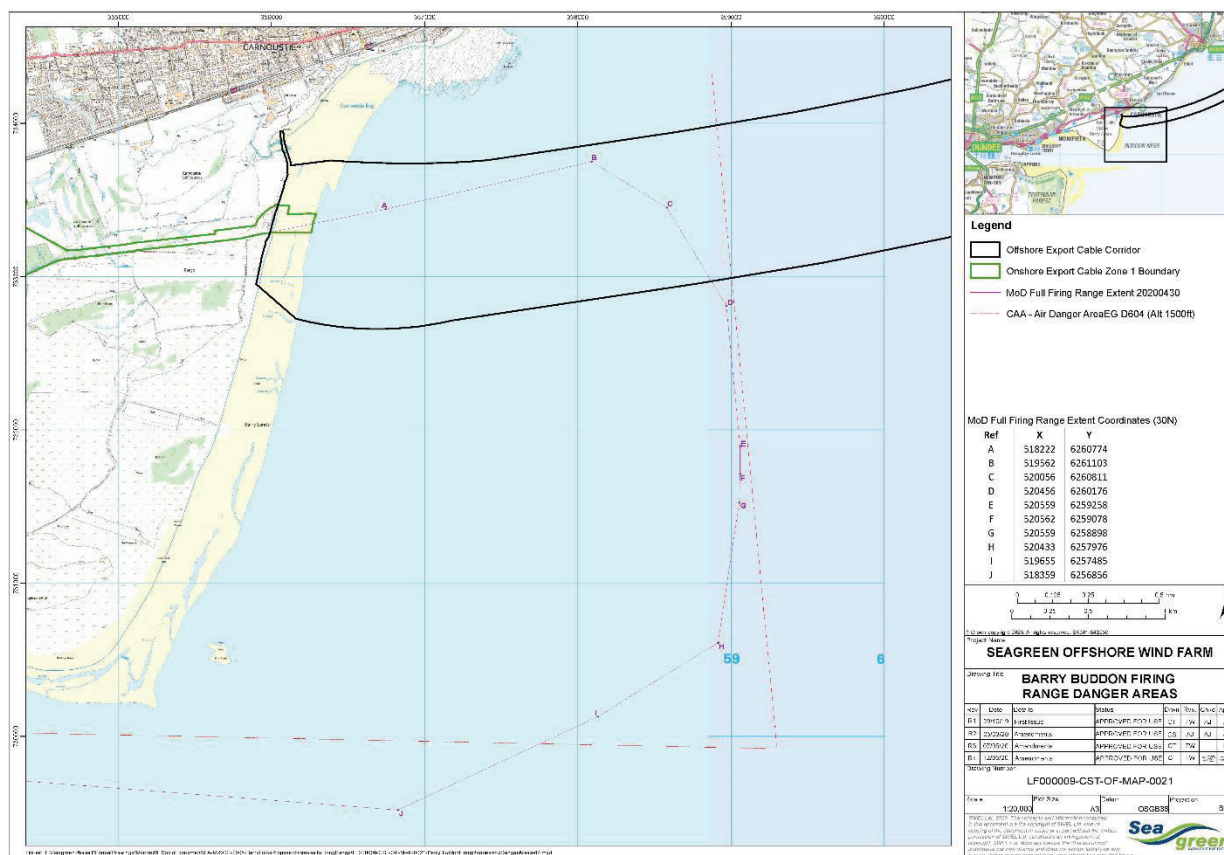


Figure 2. Export cable corridor and Barry Buddon Sea Danger Area interaction

Any overlap between cable laying activities and proximity of the cable landfall areas to the Danger Area and its firing ranges creates risks (of both working within and straying into Danger Area accidentally), both for the Seagreen Project and the MOD, through potential health and safety concerns, as well as potential constraints and/or disruption of activities.

To mitigate this risk, Condition 3.2.2.3(f) of the OTA Marine Licence, requires that the Construction Programme for the OTA includes a Communications Protocol to be developed between the Applicant (Seagreen) and the MOD for the Barry Buddon Danger Area. The Protocol must be submitted to Scottish Ministers for approval, no later than six months prior to the commencement of construction works.

2. Purpose and Scope of Communications Protocol

Following consultation with the MOD in September 2018, it was agreed that an outline communications protocol would be developed and agreed between the MOD and Seagreen, to support development of the final Protocol. This document, which initially formed the outline Communications Protocol, has been updated in consultation with the MOD to its current status and represents the final Protocol. A summary of the consultation undertaken to date relevant to this protocol is provided in Appendix B.

The Communications Protocol addresses the specific requirements of the Transmission Asset Marine Licence Condition 3.2.2.3(f), to provide an effective communications framework between Seagreen and the MOD, to ensure the safety of all vessels and personnel working within the vicinity of the Danger Area and to ensure that disruption to military firing activities within the Danger Area and Seagreen cable installation is minimised as much as possible.

The Protocol includes the following:

- Reference to a construction works programme, including anticipated commencement date of the Seagreen Project;
- Reference to proposed construction procedures, including any survey requirements, cable installation procedures and proposed cable protection measures;
- Principles of working arrangements for agreement by both parties;
- Communication processes and roles and responsibilities;
- Emergency Response Procedures in the event of any risk occurring.

The Communications Protocol will be used by the MOD and all relevant personnel involved in the construction of the Seagreen Project, including Seagreen personnel and any contractors or subcontractors.

Prior to final commissioning of the Project, the Protocol will be updated and agreed with the MOD, to ensure it is appropriate for use throughout the operational stage of the Seagreen Project. On this basis, only construction phase activities will be considered in this document at this stage.

Planning consent for the Onshore Transmission Asset (OnTA) was granted in principle by Angus Council in 2013 and extended in December 2016, following re-application by Seagreen. This allows for construction access over the Barry Buddon level crossing and use of the MOD access roads along the western and southern boundaries of Carnoustie Golf Links. The onshore cable works are not constrained by limitations imposed by the MOD, and a Temporary Access Agreement (TAA) will be agreed with the MOD, to allow construction and operation of the transmission connection across their land. A separate onshore protocol has also been developed to facilitate the onshore works and therefore, this document is focused on the OTA works only.

3. Interface with other Consent conditions

As per Condition 3.2.2.3 of the Transmission Assets Marine Licence, the Communications Protocol will form part of the Construction Programme for the OTA, which will in turn form part of a suite of approved Consent Plans, to provide a framework for construction and operational processes. The Protocol should therefore be read in conjunction with the Consent Plans listed below; the associated OTA Marine Licence conditions are listed for reference and further information:

- Condition 3.2.2.3. Construction Programme (CoP), which provides the proposed programme of construction works activities and includes at part 3.2.2.3(f) provision for the production of this Communications Protocol;
- Condition 3.2.2.4 Construction Method Statement (CMS), which sets out the proposed construction methods for the OTA and good working practices to be implemented;
- Condition 3.2.2.8. Vessel Management Plan (VMP), which sets out vessel numbers, types, management procedures and working practices and includes information on working port(s) and transit routes;
- Condition 3.2.2.9. Navigation Safety Plan (NSP), which sets out navigational safety measures, Notices to Mariners, lighting and marking and emergency response procedures; and
- Condition 3.2.2.10. Cable Plan (CaP), which sets out export cable locations and installation methods, cable technical specifications and burial risk assessment.

4. Principle working arrangements

The following sections of the Protocol set out the principles of working arrangements and commitments made by Seagreen to ensure health and safety requirements are met and disruption to military firing or construction activities is minimised wherever possible.

4.1 Avoidance of the military firing areas

To ensure disruption and/or disturbance to both MOD activities and cable installation is minimised wherever possible, as an overarching principle, through detailed design the Seagreen Project has sought to avoid any overlap between the export cable corridor and the Danger Area.

A portion to the north of the consented offshore export cable corridor (approx. 150 m at its narrowest part), does not overlap with the Danger Area (see Figure 2). Where reasonably practicable, it is Seagreen's intention to install the offshore export cables within the northern portion of the consented offshore export cable corridor, thus avoiding the majority of the Danger Area extent where reasonably practicable and minimising potential for any disturbance.

Although the permanent cable routing is anticipated to only overlap with a small section in the north of the Danger Area, it is anticipated that there will be some overlap between cable laying activities and the Danger Area, specifically relating to survey works and cable float in (further details are provided in Section 6). Where overlap with the Danger Area is identified, Seagreen will discuss with the MOD and will seek to advance book all ranges within the Danger Area as early as possible, to minimise disruption to military exercises. The process for range booking is set out in Section 6.2.

In instances where required works are identified as adjacent to, or within the Danger Area (during periods of no live firing) and it is not possible to ensure advance booking of the ranges, the following additional communication procedures have been agreed between Seagreen and the MOD. Note that this communication will be undertaken by Seagreen's contractors with the MOD directly. All communication with the MOD should be via the Operations Room at Barry Buddon and appropriate contact details have been provided;

- Vessel master/Project Manager to communicate with the MOD when vessel departs the port of mobilisation.
- Vessel master/Project Manager to communicate with the MOD when vessel arrives on site after mobilisation, or after a period of weather standby, or port call.
- Vessel master/Project Manager to communicate with the MOD when the vessel is about to come within 500m of the Danger Area. Vessel master/Project Manager to confirm that the vessel will remain outside the danger area during this period, or that works will be required within the Danger Area (during times identified as no live firing only).
- Daily morning communications between Vessel master/Project Manager and the MOD, to understand the firing times scheduled for that day and any gaps in the firing which may be used to enter the Danger Area (if necessary).
- Vessel master/Project Manager to communicate with the MOD when the vessel is departing the site, either for weather standby, a port call or demobilisation.

It should be noted that ground conditions within this portion of the export cable corridor require further investigation to ensure these are suitable for cable laying and further engineering investigations are being undertaken to confirm the final cable route at this location.

During construction works, Seagreen will also endeavour to avoid any vessel activity within the Danger Area through clear communication between vessel masters and MOD (as set out above) and marking of the Danger Area extent, both on GPS systems and utilising marker buoys as a physical demarcation (Liaison will be required with NLB with regard to these buoys, to ensure that the correct Statutory Sanction and charting processes are followed). However, it is recognised that there may be instances when vessels stray into the Danger Area accidentally. Seagreen understand that in this event, existing MOD emergency response procedures will be implemented and the procedure to be followed is set out in Section 8.

4.2 Range booking

It is understood that the firing ranges within the Danger Area, can be booked in advance and that training activities have some flexibility to move to other locations in the UK. If it is not possible to avoid the Danger Area, either during cable routing or cable float in, the Seagreen Project would seek to advance book the Danger Area for the duration of cable installation activities. Early engagement with the MOD is necessary to enable activities to be deconflicted.

Offshore cable installation activities are anticipated to occur over two discreet one month periods between September 2021 and February 2022. Discussions with the MOD indicate that Seagreen would need to book out the Danger Area for the duration of works, subject to any critical MOD training activities required.

The MOD have advised that as much advance notice as possible should be provided to secure booking and that most ranges within the Danger Area are booked a minimum of three months in advance. The MOD have also advised that although cable installation activities would take priority over routine military training operations, if a requirement for imperative military training was received this would need to take priority over the Seagreen Project.

5. Indicative Construction works programme

An indicative construction schedule and works programme for the Seagreen project is provided in Table 2 below. Further details of construction procedures and cable laying activities are provided in the following sections.

At this stage, all dates for construction works are provisional but reflect the most accurate project information currently available.

Table 2 Indicative construction schedule

Description	Indicative Date
Commencement of onshore construction works (no access to MOD land required other than for access arrangements)	Q1 2020
Commencement of offshore construction works at landfall (requires access to MOD land)	Q4 2020
Installation of jacket foundation, WTG's, OSP and inter array cables	Q3 2021 – Q4 2023
Offshore Transmission Works Installation (export cables)	Q3 2021 – Q1 2022
Commercial Operations Date	Q4 2023

6. Construction procedures

6.1 Survey requirements

Prior to any cable installation works it will be necessary to undertake geophysical surveys of export cable ground conditions to confirm cable routing and Unexploded Ordnance (UXO) magnetometer surveys for any discarded ammunition types across the export cable corridor, including the nearshore area and landfall. These were undertaken in Q3 2020. It is also understood that WWII ordnance have been found offshore of the Firing Range and therefore Unexploded Bomb (UXB) surveys will also be required.

Following final confirmation of the export cable alignment, a pre lay grapnel run survey will be undertaken. Specific dates will be provided to the MOD following confirmation by contractors. Surveys which overlap with the danger area will only be undertaken by Seagreen with prior communication and agreement with the MOD. Such agreement should not be unreasonably withheld or delayed. Should any additional surveys be required, Seagreen will communicate these with the MOD as soon as possible for agreement.

6.2 Cable installation works

Cable installation works relevant to this protocol involves works from the onshore transition joint bays above Mean High Water Springs (MHWS), through the rock revetment, across the intertidal and subtidal areas to the wind farm and connection with the OSPs. Figure 3 demonstrates the landfall cable arrangements and the export cable alignment route in the vicinity of the Danger Area.

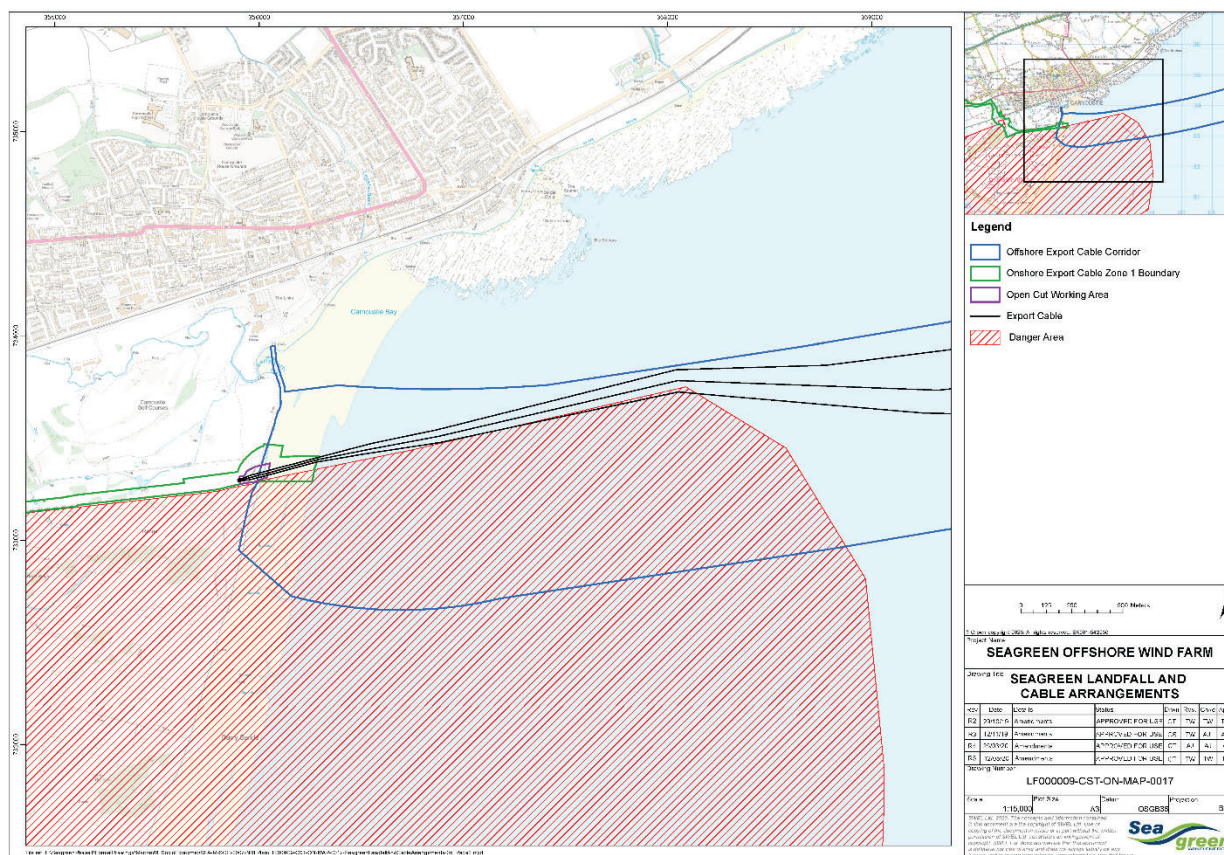


Figure 3. Export cable alignment route in the vicinity of the Danger Area

6.2.1 Cable installation at landfall

Cable installation at the landfall involves either horizontal directional drilling (HDD) or open cut trenching through the rock revetment and across the intertidal and subtidal areas to meet the offshore cable installation vessel. The removal of the rock revetment will be designed to prevent breach by seawater, and will be reinstated using higher grade construction material.

These works commenced in Q4 2020. It should be noted that these works are not anticipated to impact upon the Danger Area or firing range activities.

6.2.2 Export cable installation

Export cable circuit installation is currently anticipated to take place over two separate offshore campaigns. Each campaign is anticipated to take one month, including contingency and indicative dates for these campaigns are as follows:

- Circuits one and two: September – December 2021; and
- Circuit three: January- February 2022

Should there be any change to the indicative dates provided these would be communicated to the MOD as soon as possible, to enable advanced booking of the Danger Area.

Initially, seabed clearance will be undertaken by vessel along the proposed cable routes, to remove any potential obstructions e.g. abandoned fishing equipment. A cable laying vessel which has suitable depth will then be positioned beyond the extent of the Danger Area. The cable end will be released from the vessel and will be floated into landfall and pulled through installed pipes within the rock revetment. Cables will then be submerged into the seabed and cable jointing will commence at the transition joint bay. Cables will be buried into the seabed via jetting (or similar consented technique) to a depth of at least 2m at landfall and 1m across the entire route out to the wind farm.

Cable installation activities (specifically seabed clearance, cable float and cable burial) will encroach upon the extended Danger Area and it will be necessary for the project to book out the Danger Area for the duration of the works which will be confirmed with the MOD.

6.2.3 Cable protection methods

Details of cable protection methods are currently being confirmed through detailed design. However, it is anticipated that cables will be buried to a depth of at least 2m at landfall and at least 1m across the entire route out to the wind farm. Where burial depths cannot be achieved alternative cable protection measures will be considered. Additional information will also be contained within the OTA Cable Plan (LF000009-CST-OF-PLN-0009).

6.2.4 Vessel management procedures

All vessels involved in the Seagreen project will follow procedures set out within this plan and in the associated consent plans including the Vessel Management Plan and Navigational Safety Plan. These include requirements relating to pre-planned routing and emergency vessel route deviations. Furthermore, contractors will be required to establish marker buoys as a physical demarcation of the Danger Area to prevent unauthorised entry by vessels.

7. Communication Procedures

This section of the Protocol sets out clear communication procedures between the MOD and Seagreen, including an outline of roles and responsibilities and key points of contacts in each organisation.

7.1 Roles and Responsibilities

This section of the Protocol outlines the key points of contact, and their roles and responsibilities for both Seagreen and the MOD during construction of the Seagreen Project in all matters relating to the Barry Buddon Danger Area and firing ranges. These points of contact will be responsible for the sharing of all relevant information required.

The Marine Co-ordination Centre (MCC) will facilitate offshore activity (communications and information dissemination during the construction phase via standard procedures in the first instance, including Notices to Mariners, Weekly Notices of Operations, Vessel details).

Contact details for key personnel are provided in Table 4 below, for both Seagreen and MOD. This will also include an overview of the key responsibilities.

Table 4 Contact details of key personnel

Role	Responsibility	Name	Contact Details
Training Safety Officer Barry Buddon		Gary Archer	Redacted
MOD Senior Estates Surveyor		Ellen Grant	Redacted
Barry Buddon Operations Room	Control range operation activity	N/A	Redacted
Seagreen Marine Co- ordination Centre Duty Manager	Facilitate offshore activity by establishing communication procedures	TBC	TBC

The information to be provided to the MOD by Seagreen and to Seagreen by the MOD during the relevant phases of development will be detailed in Table 5 below. This will include the content and timescales for dissemination of information.

Table 5 Information to be provided

Phase	Information to be submitted	Current status
Prior to commencement of construction activities	Barry Buddon Communications Protocol	This version of the protocol will be provided to MOD for approval.
	Onshore Communications Protocol	
	Construction programme	The detailed construction programme will be provided within the Construction Programme Consent Plan.
	Confirmation of construction activities and procedures	Construction activities and procedures are described in this protocol.
During construction of the Seagreen Project	Where possible 6 months' notice (in the form of an indicative schedule) will be given to the MOD prior to any anticipated entry into the Danger Area. The purpose of this is to give the MOD an indicative timeframe as to when vessel entry is required so that the Danger Area can be booked by Seagreen to minimise disruption. If vessel entry is required in less than two months, notice will be given as soon as possible.	N/A
During construction of the Seagreen Project	One week in advance, confirmed details of entry requirements into the Danger Area will be issued to the MOD with the following included: <ul style="list-style-type: none"> Vessel (s) name and call sign; Vessel (s) MMSI; Approx. time/date of entry; Approx. time/date of exit; Planned vessel route while within ODA; and Nature of work to be undertaken 	N/A
	Any additional notification will be provided via the Notice to Mariners procedure	

Effective communication of the above information will ensure that no pre-planned entry into Danger Area occurs without prior knowledge of the MOD and will ensure safety of any Seagreen Project personnel working on site.

8. Emergency Response Procedures

This section presents procedures to be followed in the event of an emergency in, or near the Danger Area. In the event of a vessel straying into Danger Area or an alternative project emergency, existing emergency response procedures will be implemented by the MOD. The process and procedures to be followed are set out below:



The same process will be followed in the event of an aircraft entering the CAA Danger Area (EG D604). Seagreen would be required to inform the MOD in advance of any known aircraft operating in proximity to the Danger Area.

Appendix A –List of Abbreviations

Acronym	Term
OTA	Offshore Transmission Asset
MOD	Ministry of Defence
OnTA	Onshore Transmission Asset
CGR	Converted Galley Range
LFTT	Live Fire Tactical Training
IBSR	Individual Battle Shooting Range
CoP	Construction Programme
CMS	Construction Method Statement
VMP	Vessel Management Plan
NSP	Navigational Safety Plan
CaP	Cable Plan
TAA	Temporary Access Agreement

Appendix B – Consultation Summary

Date of consultation	Format	Summary
05 September 2018	Meeting at Barry Range Carnoustie	Project update meeting. Parties agreed to develop an outline protocol to support the development of a final protocol, to satisfy consent conditions
29 January 2019	Document submitted to MOD	Draft outline protocol submitted to MOD for review and comment.
20 February 2019	Meeting at Barry Range Carnoustie	Further project update meeting, Draft protocol resubmitted for review and comment.
16 July 2019	Meeting at Barry Range Carnoustie	Project update meeting and discussion on draft outline protocol. It was agreed at this meeting that standard communication procedures via the MCC and NtM would be sufficient for the MOD and this would be set out within the protocol. In addition, it was also agreed that existing MOD Emergency response procedures would be implemented for the project.
03 October 2019	Meeting at MOD Forthview House, Rosyth	Project update meeting with presentation and discussion on indicative construction timelines and construction methods at landfall and along the export cable route.
11 November 2019	Meeting at Barry Range Carnoustie	Project update meeting to discuss the revised offshore protocol submitted for review and approval. MOD advised that there is no requirement to delineate individual firing ranges within the protocol as encroachment into one range would require shut down of all ranges. The ranges should therefore be treated as one Danger Area. MOD also requested all commercial information should be removed from the protocol. MOD confirmed approval of the protocol in principle
25 March 2020	Conference Call	Conference call to provide a project update to MOD including discussion on construction timelines, construction methodology and forthcoming pre construction survey works.
07 May 2020	Conference call	Conference call with Seagreen's export cable survey contractors, Seagreen's consents team and the MOD to confirm

		survey activities and to discuss additional communication procedures to ensure safety of working when vessels are operating adjacent to the Firing Range.
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