

**BROUGH HEAD
WAVE FARM LIMITED**



**BROUGH HEAD WAVE FARM
PROJECT BRIEFING DOCUMENT**

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1. INTRODUCTION

1.1 Brough Head Wave Farm Limited

Brough Head Wave Farm Limited is a partnership between wave energy company Aquamarine Power Limited and utility company SSE Renewables UK Limited. Brough Head Wave Farm Limited (BHWFL) was incorporated in May 2009 with the aim of using wave energy to generate clean, renewable electricity from Orkney Waters on a commercial scale.

Wave energy company Aquamarine Power was founded in 2005 to commercialise the Oyster hydro-electric wave energy converter. Oyster is designed to create clean renewable electricity from energy found in nearshore waves. Commercialisation of Oyster has a global focus with Aquamarine Power pursuing projects throughout Scotland, Ireland and the USA. In Orkney, activities to date have been focused at the EMEC wave test site.

SSE Renewables UK Limited is a wholly owned subsidiary of the Scottish and Southern Energy (SSE) Group, which has an installed generation capacity of over 11GW, including almost 2.3GW of renewables, and supplies energy to 10 million customers across the UK and Republic of Ireland. SSE defines its core purpose as being able to provide the energy people need in a reliable and sustainable way. SSE is one of the UK's leading offshore renewable energy developers, with an interest in some 6.8GW of development projects, including 800MW of wave and tidal energy projects in the Pentland Firth and Orkney Waters.

1.2 Agreement for Lease

In March 2010 BHWFL was granted an exclusive Agreement for Lease (AfL) on an area of the Orkney coast stretching from Costa Head in the north to Neban Point in the south-west (see Figure 3.1). This agreement was granted through The Crown Estate's Pentland Firth and Orkney Waters leasing round for commercial wave and tidal energy projects. This was the world's first seabed leasing round and was designed to enable marine energy developers to investigate the potential for the installation of wave and tidal energy devices around the UK's coastline.

The agreement provides us with the security to carry out site investigations and environmental surveys in this area for our proposed Brough Head Wave Farm in the knowledge that no other wave and tidal energy projects will be developed in the same area. The agreement does not however provide permission for us to install devices in this area.

Permitting for any proposed development must include a full Environmental Impact Assessment (EIA) and Navigational Safety Risk Assessment (NSRA), both of which include extensive consultation with stakeholders.

1.3 Document Purpose

BHWFL proposes to install Oyster wave energy devices within the area covered by the AfL with a total installed capacity of up to 200MW. This update document outlines the process by which we will select specific sites within the area covered by the agreement for the proposed phased installation of Oyster devices. It also describes how we will determine what will be covered in the EIA for the project.

The purpose of this update document is to inform an ongoing dialogue with regulators, advisors and local stakeholders as we proceed to follow best practice throughout the EIA and NSRA processes for the proposed Brough Head Wave Farm.

2. PROJECT OVERVIEW

2.1 Technology

Oyster is a nearshore wave energy converter, typically deployed in 10 to 15 metres (m) water depth. The oscillating action of the waves against the wave energy converter (WEC) (or 'flap') drives hydraulic pistons which pump pressurised freshwater back to shore through a closed loop pipeline system. The onshore hydro-electric plant converts the hydraulic pressure and flow into electrical power via a Pelton wheel turbine which in turn drives the electrical generators.

A key design philosophy of the Oyster technology is to ensure the offshore components are as simple and reliable as possible. As such its operation is not reliant on any electrical components or active control functions operating in the offshore environment. The key components of the technology are shown in Figure 2.1.

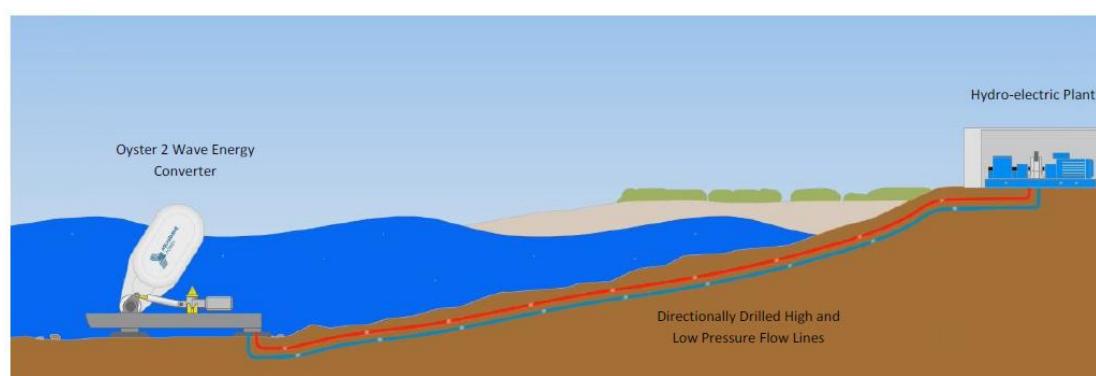


Figure 2.1 Schematic of the Oyster technology

2.2 Offshore Infrastructure

Each Oyster device may generate around 1MW of electricity. Individual Oyster devices will be installed on monopile foundations and linked by sets of interconnecting pipelines (high pressure, low pressure and a control umbilical). These pipelines will connect a number of Oyster devices to a similar set of pipelines which are directionally drilled from the onshore hydro-electric plant, beneath the seabed, to form a closed-loop hydraulic system. BHWFL is exploring the number of Oyster devices which may be linked to a single onshore hydro-electric plant in order to maximise efficiency. The Oyster devices will protrude above the sea surface (approximately 3 – 5 m) and will be appropriately marked.

2.3 Onshore Infrastructure

The onshore hydro-electric plant will include Pelton wheel turbines, electrical generators, a header tank, filtration system, transformers and accumulators (to smooth the flow of the pressurised water). Grid connection will be through the planned Scottish Hydro Electric Transmission Limited (SHETL) substation. We anticipate that for up to 40 devices, the onshore

footprint may be in the order of 4,000 m² (0.4 ha), accounting for the plant, vehicle turning and parking areas. The location of the onshore infrastructure will be informed by offshore site selection, further studies and consultation.

2.4 Project Phasing

BHWFL proposes to install Oyster devices within the area covered by the AfL with a total installed capacity of up to 200MW. We propose to take a phased approach to the development of the area with the proposed first phase of the project to be located in the south of the area. It is anticipated that this first phase may account for between 30MW and 50MW of the total project capacity, depending on technical and environmental constraints. For each phase of the project, an environmental impact assessment would be undertaken and consent would subsequently be sought from Marine Scotland.

2.5 Environmental Impact Assessment & Navigational Safety Risk Assessment

The EIA and NSRA processes for the proposed Brough Head Wave Farm will consider the likely environmental and navigational impacts of the project through the installation, operation and maintenance and decommissioning phases of the project.

Environmental Impact Assessment (EIA) typically includes the following steps:

- Defining the project and the extent of its zone of influence;
- Describing why is the project required and what other alternatives are there;
- Scoping the project (EIA Scoping Report and Navigational Preliminary Hazard Analysis (PHA)) to identify potential effects and how these should be assessed;
- Define the scope of the EIA and NSRA based on stakeholder responses to the scoping stage;
- Describe the baseline environment and assess the sensitivity of the receptors and resources likely to be impacted;
- Carry out consultation throughout the EIA and NSRA processes;
- Assessment of potential effects usually includes the following steps:
 - Assess the magnitude of the possible environmental effects;
 - Evaluate the significance of these predicted effects, i.e. consideration of sensitivity of receptors;
 - Develop mitigation measures and establish how they are to be integrated into the project;
 - Evaluate the significance of the residual effects;
 - Assess potential cumulative effects;
- Production of an Environmental Statement (ES) and Navigational Safety and Risk Assessment (NSRA) reports covering all findings and summarise in a non-technical summary; and
- Implement mitigation measures and environmental monitoring as required.

3. BROUGH HEAD WAVE FARM DEVELOPMENT ZONES

Within the AfL area, three zones have been defined (Figure 3.1).

The boundaries of each zone are:

- North – Brough of Birsay to Costa Head
- Mid – Southern border of Marwick SPA to Brough of Birsay
- South – Neban Point to the southern border of Marwick SPA

The North and Mid areas will not be included in EIA Scoping at this stage. However, these areas have not been excluded from development and would be the subject of further scoping in due course.

Indications are that the likely location for the SHETL substation will be on the west coast within our designated South area. For this reason, the South area is our preferred area for the first phases of development. As such, we will submit a request for a formal Scoping Opinion to Marine Scotland, in the form of an EIA Scoping Report for South area only.

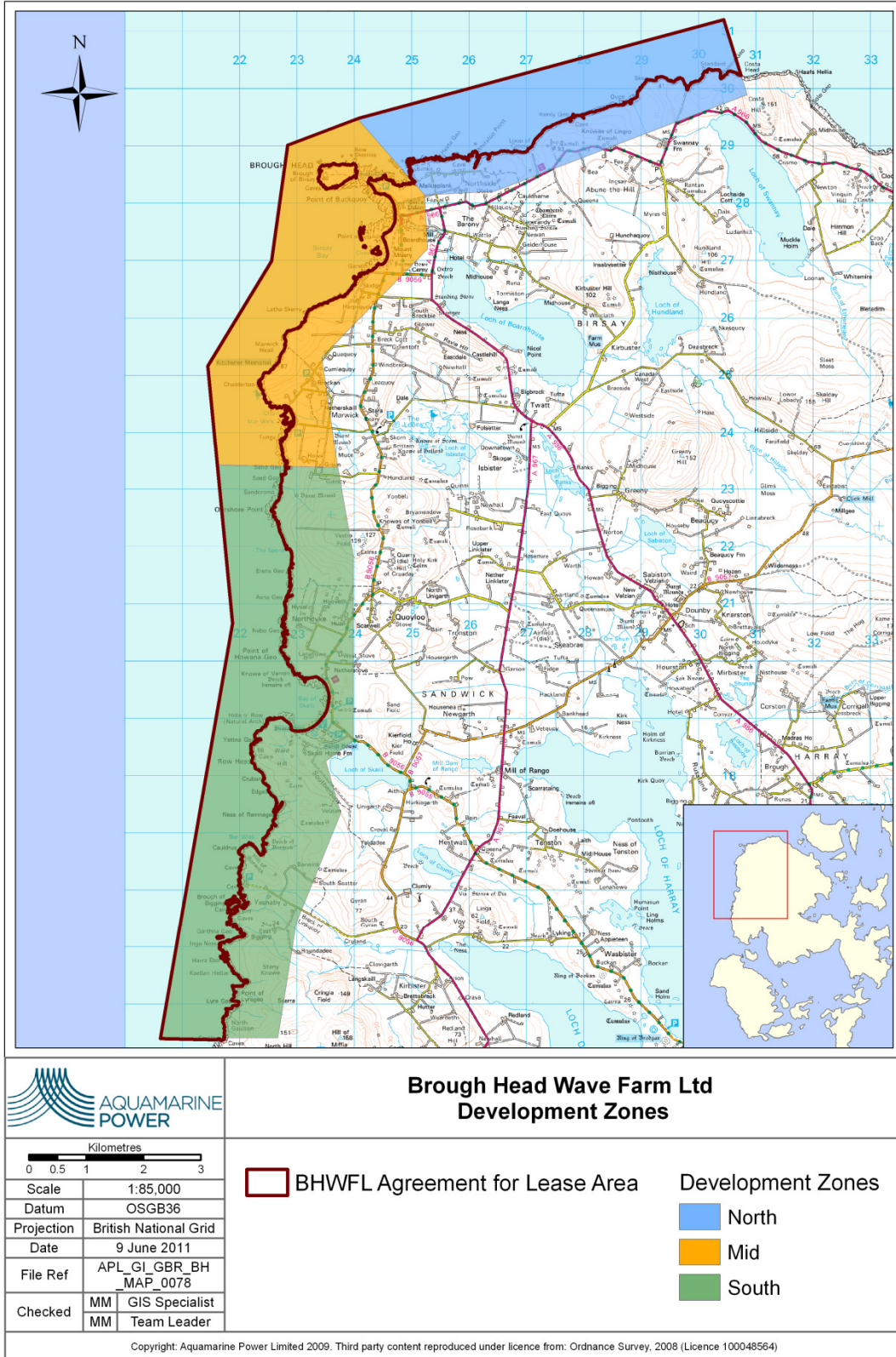


Figure 3.1 Brough Head Wave Farm Development Zones

4. SCOPING REPORT

4.1 Overview

It is important at this early stage for BHWFL to identify and understand the key sensitivities and development risks across a larger area than would be required for the initial development phase. We believe that as well as determining the types of surveys required for a development, the EIA Scoping process is also useful as an iterative process for site refinement. The Scoping Report will support a request for a Scoping Opinion to highlight the environmental and socio-economic sensitivities within the entire South area. This will aid the next stage of site selection and detailed design process carried out during the EIA.

The Scoping Report and subsequent scoping opinion will aim to ascertain the likely total development capacity of the South area in the context of the full 200MW AfL area. This will also be informed by bathymetry surveys to be carried out during summer 2011.

Following receipt of the Scoping Opinion for the South area, we will be in a position to make an informed decision regarding the extent of development within the other two identified zones, North and Mid, for which Scoping Reports would be submitted at a suitable time.

4.2 Aims

The Scoping Report for the South area will:

- Describe The Crown Estate's seabed leasing process;
- Explain the proposed development and the reasons for selection of the South area;
- Provide an indicative project development timeline;
- Identify the known environmental baseline conditions in the South area;
- Identify the potential environmental constraints and benefits in the South area; and,
- Identify further studies which may be required during the EIA process.

Further to the Scoping Report, BHWFL will seek a Scoping Opinion from Marine Scotland, its advisors and local stakeholders on all of the above with the aim to:

- Understand their position on different locations within the South area;
- Understand their views on the key risks and sensitivities within the South area in the context of the west and north coasts of Orkney and Marwick Special Protection Area (SPA);
- Obtain feedback on the proposed monitoring approach, environmental studies and impact assessments; and,
- Obtain clarity on the scientific requirements for monitoring and the level of data required for EIA.

The scoping process is an important part of the ongoing dialogue between BHWFL and all stakeholders that will continue throughout the EIA and beyond submission of the Environmental Statement (ES).

5. SITE SELECTION

Various site investigations will be undertaken over the coming year. The aim of these surveys will be to inform detailed site selection to identify areas that may be suitable for the first phases of development.

During summer 2011, bathymetry surveys of the nearshore region will take place. These will aid site selection from a technical installation perspective as well as provide information on the available resource across the site.

Additionally, shore-based marine wildlife monitoring from a series of vantage points, archaeological walkover surveys and meetings with local stakeholders are underway to assist with baseline characterisation of the AfL area.

The results of each of these, plus the Scoping Opinion, information gained during consultation meetings, and publically available environmental and socio-economic data will be used in a constraints mapping exercise to select a site for the first phase of development. BHWFL proposes this approach as a robust strategy to maximise understanding of the area and minimise potential environmental or socio-economic impacts.

6. ENVIRONMENTAL IMPACT ASSESSMENT SCHEDULE

BHWFL will prepare an EIA Scoping Report for submission to Marine Scotland in August 2011.

Following site selection, we will define and agree the scope of the EIA with Marine Scotland and commence EIA studies in 2012. It is proposed to finalise all studies and submit an ES and Marine Licence / Section 36 applications in 2013.

7. FEEDBACK

Information gathered from responses to this document and meetings held following distribution of this document will aid site selection, inform the content of a Scoping Report and guide future stakeholder consultation activities.

We would welcome any general comments, views or specific feedback on any aspect of the proposed project as a whole and for the South area in particular. There will, of course be further opportunities to feed into this consultation as the project progresses through the statutory process.

All feedback should be directed to marten.meynell@aquamarinepower.com.

8. ACRONYMS AND GLOSSARY

AfL	Agreement for Lease, granted through The Crown Estate's Pentland Firth and Orkney Waters leasing round for commercial wave and tidal energy projects
BHWFL	Brough Head Wave Farm Limited
Consultation	Occurs with stakeholders throughout the EIA and NSRA process
EIA	Environmental Impact Assessment
EMEC	European Marine Energy Centre; Runs the wave and tidal device test site in Orkney
ES	Environmental Statement: Reports on the results of the EIA
MW	Megawatt
NSRA	Navigational Safety and Risk Assessment
Oyster	Aquamarine Power's Wave Energy Converter
PHA	Preliminary Hazard Assessment; The first step in the NSRA process
Scoping	Part of the EIA process that helps define the project and the studies required to assess potential impacts
SHETL	Scottish Hydro Electric Transmission Limited
SPA	Special Protection Area; European Protected Site
WEC	Wave Energy Converter