Oyster 2 Wave Energy Project

European Marine Energy Centre
Billia Croo, Orkney

Decommissioning Programme
Phase 1

DRAFT FOR CONSULTATION

REPORT REFERENCE NUMBER: OY02-DEC-PM-APL-PLN-0001

CONTENTS

1. INTRODUCTION

Sections 105 – 114 of the Energy Act 2004 introduces a decommissioning scheme for offshore wind, wave and tidal energy installations. Under the terms of the Act, the Secretary of State of the Department of Energy & Climate Change may require a person responsible for one of these installations to submit (and eventually carry out) a decommissioning programme for the installation.

This document outlines Aquamarine Power Limited's (Aquamarine Power) programme for decommissioning Phase 1 of its Oyster 2 Array Project. The Oyster 2 Array Project consists of an array of three Oyster wave energy convertors (WECs).

Oyster 2, *Phase 1* to be installed this summer (2011) includes:

- One 800 kilowatt (kW) Oyster 2a WEC; and
- Four foundation piles including:
  - 2 piles for Oyster 2a;
  - 1 monopile for Oyster 2b; and
  - 1 monopile for Oyster 2c.

Phase 2 of the Oyster 2 project will include an Oyster 2b WEC and an Oyster 2c WEC, latching piles and additional seabed infrastructure to connect the devices together to be installed in 2012 and 2013. Consent for Phase 2 has been applied for and a decision is expected in March 2012. It is intended that this Decommissioning Programme (DP) will be updated in 2012 to include Phase 2 of the Oyster 2 project.

The Oyster 2a WEC and foundation piles are 100% owned by Aquamarine Power.

Please be advised that this Decommissioning Programme (DP) is a draft programme for consultation and will be updated to take account of any comments and/or information gained during the 30 day consultation period (from **Friday 15th July 2011** to **Monday 15th August 2011**). The DP will then be formally submitted to the Department of Energy & Climate Change for approval by the Secretary of State.

2. EXECUTIVE SUMMARY

Aquamarine Power has developed the Oyster, a Wave Energy Converter (WEC), the device captures wave energy and converts it into electrical energy (see Figure 1 below). The offshore element of the Oyster 2a device is made up of two hydraulic pump modules, a base frame and a flap. The device will be fixed on to two pre-installed foundation piles which have previously been set into the seabed into pre-drilled rock sockets and grouted into place. The cyclical oscillating action of waves on the flap cause the it to pivot on its hinges and pump hydraulic fluid through a pipeline to a shore based electricity generating turbine. This turbine in turn feeds electrical energy to the grid.

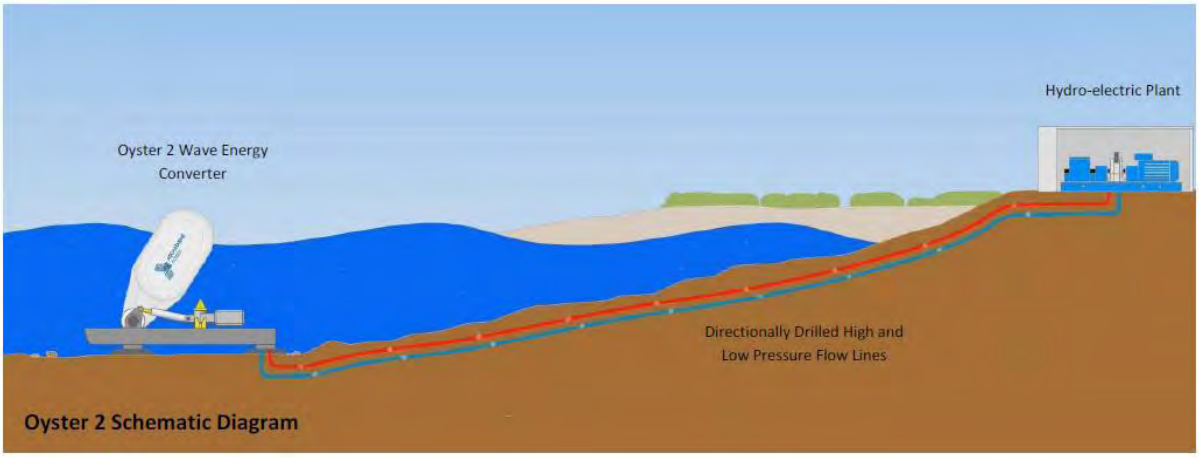

Figure 1 Schematic Diagram of Oyster 2a

The installation of Oyster 2a (the second generation of the Oyster devices) and foundation piles (two for Oyster 2a, a monopile for Oyster 2b and a monopile for Oyster 2c) is scheduled for the summer of 2011 (works commenced in June 2011) at the European Marine Energy Centre (EMEC) wave device test area in Billia Croo, Orkney.

The design life of Oyster 2a and the foundation piles is 20 years, however it is expected that decommissioning would take place when the current seabed lease expires in 2015 or subject to a seabed lease extension being granted by EMEC, in summer 2026.

The decommissioning of Oyster 2a is described in the following sections of this document. In summary, the process will:

- Commence with mobilisation of the decommissioning vessels to the site.
- Divers will be used to perform and guide the decommissioning operations, however diver safety will be a prime consideration in planning the individual tasks and where possible automated, diverless methods will be employed.
- The Oyster 2a WEC will be in the locked down or closed state.
- The low and high pressure pipelines connecting the device to the shore based elements of the system will be cut, and left on the seabed for later recovery as part of decommissioning activities.
- The Oyster 2a WEC will be removed in one piece by cutting it clear of the seabed at the base of the two foundation piles. This will be done as close to the seabed as possible.
- Towing bridles will be pre-installed onto the device prior to the cutting operation. The remotely operated cutting system will allow the Oyster 2a WEC rise on its own buoyancy when the pile cuts are complete.
- The Oyster 2a WEC will be wet towed back to shore by the decommissioning vessels for disassembly.
- The two Oyster 2a foundation piles will be cut flush with the seabed by divers.
- The two monopiles associated with Oyster 2b and 2c will be cut flush with the seabed by divers.[1]

[1] The Oyster 2, Phase 2 Decommissioning Programme will include the decommissioning arrangements for the Oyster 2b and 2c WECs.

- All seabed pipe work and cabling will be recovered using vessel based carnage and buoyancy modules and transported back to shore for scrapping.
- Any waste produced during decommissioning operations will be removed from site onboard the construction vessel.
- A post decommissioning seabed survey would be carried out following decommissioning and a report provided to the relevant parties (Department of Energy and the Climate Change (DECC) and Marine Scotland).

3. BACKGROUND INFORMATION

3.1 Layout of Facilities to be Decommissioned

The proposed location of the Oyster 2a device is in the near-shore area of the EMEC Wave Test Site at Billia Croo. This device has been sited according to available wave resource, water depth, seabed gradient and seabed protrusion. The location of the WEC is presented as the coordinates of the centre point in Table 1, alongside coordinates of the pipeline exit point and the centre point of the additional two devices (Oyster 2b and 2c) for which the foundations will be drilled. Detailed design may result in slight changes to these co-ordinates, but within a small envelope of variance. The layout of the facilities to be decommissioned is shown in Figure 2.

Component	Eastings (m)	Northings (m)	Latitude (N), WGS84 (DD MM.MM)	Longtitude (E), WGS84 (DD MM.MM)
Oyster 2 (A)	321868	1009937	58 58.166	-3 21.629
Oyster 2 (B)	321803	1009882	58 58.136	-3 21.697
Oyster 2 (C)	321773	1009843	58 58.115	-3 21.727
Pipeline exit point	321892	1009951	58 58.174	-3 21.605

Table 1 Oyster 2 Location Coordinates

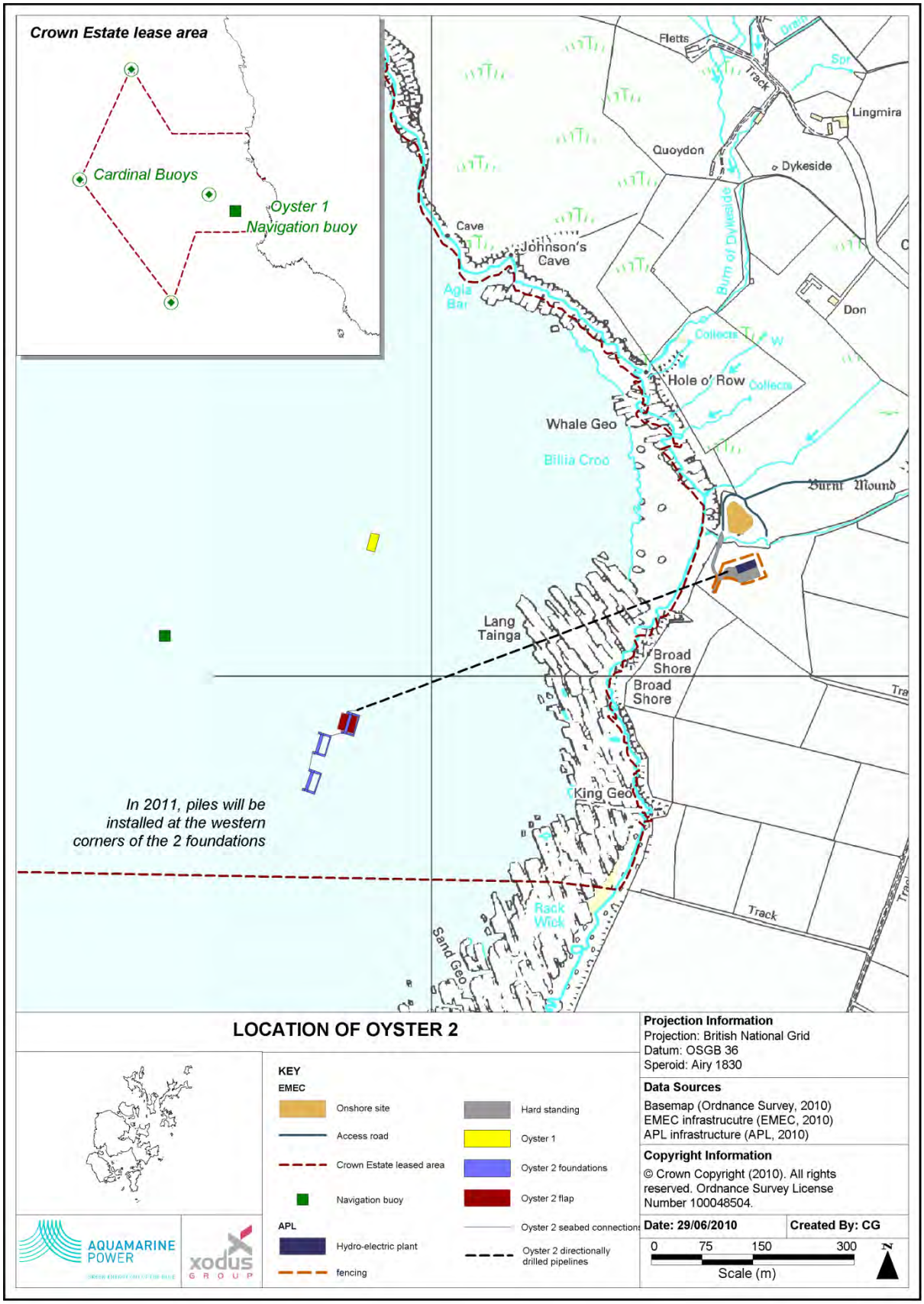

Figure 2 Location of the Oyster 2 wave device relative to adjacent facilities at EMEC

3.2 Relative Location to Adjacent Facilities

Figure 2 shows the location of the device relative to other marine devices and adjacent facilities at EMEC.

The EMEC area is marked by cardinal buoys and comprises several berths for the testing of marine energy converters.

Other marine devices in the area include Aquamarine Power's Oyster 1 device which is located some 300 metres north of the Oyster 2a device and foundation piles. Oyster 1 is scheduled to be decommissioned by 2014 so will not be present when Oyster 2a and foundation piles are decommissioned.

It is intended to install a further 2 WEC's, Oyster 2b and Oyster 2c, in summer 2012 and/or 2013. These WEC's would be installed onto monopiles (one for each WEC). These monopiles will be installed at the same time as Oyster 2a, in the summer of 2011.

At the time of decommissioning, the Oyster 2b and 2c WECs are likely to be present and there may be other installations present; this section of the final decommissioning programme will hence be updated accordingly.

3.3 Weather and Sea Conditions

Oyster can operate in tidal flows of up to 1m/s. Based on the Pentland tidal model developed in Mike21[2] the majority of the Oyster site at Billia Croo experiences a mean peak tidal current of less than 0.5m/s. Therefore tidal flow is not considered to be a constraining factor at the site.

The site is exposed to wave action which will prove an unavoidably challenging environment to work in, which will be common to all wave energy installations in the nearshore area at EMEC.

Decommissioning vessels often require a significant wave height of less than 1.5m to operate. The modelled significant wave height exceeds 1.5m 47% of the time; this is also supported by Acoustic Doppler Current Profiler (ADCP) data collected from the Oyster 1 site (which is also at Billia Croo).

3.4 Local Marine Activity

3.4.1 Current Local Marine Activity

As part of the application for the licences required to deploy Oyster 2a and the foundation piles (see Section 3.6), environmental information was collated in an Environmental Supporting Document[3]. Part of this document includes a Navigational Safety Risk Assessment (NSRA) which specifically considers the risk to navigation posed by the installation, operation and maintenance, and eventual decommissioning of the Oyster WECs.

[2] Mike 21 - Inland, Coastal Waters and Seas in 2D, DHI Group (http://www.dhigroup.com/Software/Marine/MIKE21.aspx)

[3] Xodus Aurora (2010) Oyster 2 Project, Offshore Supporting Document for Deployment of 800kW Device OY02-DES-RH-XOD-REP-0001

As part of the NSRA, Automatic Identification System (AIS) and Vessels Monitoring System (VMS) data has been used to assess existing traffic patterns in the EMEC test site area. The following patterns were identified:

Traffic passing close to or within the test site

Data showing traffic passing close or within the test area has been investigated and in most cases consists of:

- Vessels engaged in maintenance of the site buoys.
- Vessels engaged in installation/maintenance/survey activities within or adjacent to the EMEC Wave Test Site.
- Vessels engaged in site investigation survey work of adjoining areas for potential offshore renewable energy installations.

The latter two activities have been much in evidence in 2009/2010.

Traffic types

The types of vessels identified as using Hoy Mouth as an entry/exit point to Scapa Flow/Stromness are:

- Ferries plying the route between Stromness and Scrabster.
- Vessels engaged in fishing off the west coast of Mainland.
- RNLI Lifeboats engaged in Search and Rescue (SAR) activities.
- Dive boats on passage to dive sites.
- Yachts on passage along the west coast of Mainland Orkney.

A significant number of cruise ships visit the Orkney Isles particularly between April and September each year. None of these visits are known to use the passage through Hoy mouth or along the west coast of the mainland and will therefore be unaffected by decommissioning. There are no military exercise areas immediately adjacent to the test site and there are no indications of the area being a transit route for other than surface vessels.

Future traffic patterns

There is a plan to create a renewables support base in Scapa Flow at Lyness on Hoy, this would likely increase traffic movements approaching and departing various waters within Orkney including the EMEC test site and the shallow water test site area. There is a possibility that the increase in oil and gas exploration to the west of Orkney Islands could increase support vessel traffic however, this will use a similar route to the Northlink ferry and would largely be unaffected by additional devices in the shallow water test site. It is not considered that fishing traffic in the area is likely to increase. In the light of the recent seabed lease agreements between the Crown Estate and marine renewable energy developers, there are several other marine renewable energy installations proposed in the surrounding areas of the west coast of Orkney. These developments will involve the use of maintenance and support vessels of various type and size, transiting from Hoy Mouth to proposed Offshore Renewable Energy Installations (OREI) off Brough Head and Costa Head.

3.4.2 Potential Effects During Decommissioning

The Billia Croo wave site area is predominantly used for vessel passage throughout the year, although fishing takes place close by and inshore during bad weather. There is no oil and gas exploration in the area.

The decommissioning of Oyster 2a and the foundation piles is expected to have similar impacts on marine activities as the installation and construction phases. As such, the decommissioning of Oyster 2a and the foundation piles will, to an extent, reduce the width of the inshore passage. However this will not be to such an extent that vessels cannot pass.

Where a mooring spread is required to maintain position, it is not yet possible to provide an accurate figure for the extent of the sea area "take" as the vessel mooring requirements have yet to be determined (this information will be provided in the final decommissioning programme). Decommissioning activities may be undertaken by a wide variety of vessels with differing position keeping systems. As an estimate of the 'worst case' mooring system, in terms of sea area 'take', it should be considered that the decommissioning vessel will be moored using four off catenary mooring lines, which will result in an anchor spread radius of approximately 300m.

Decommissioning will be conducted during fine weather and in daylight hours.

3.5 Proximity to Environmentally Protected Areas

Figure 4 shows the proximity of the environmentally protected areas to the Oyster 2a and foundation piles location at EMEC.

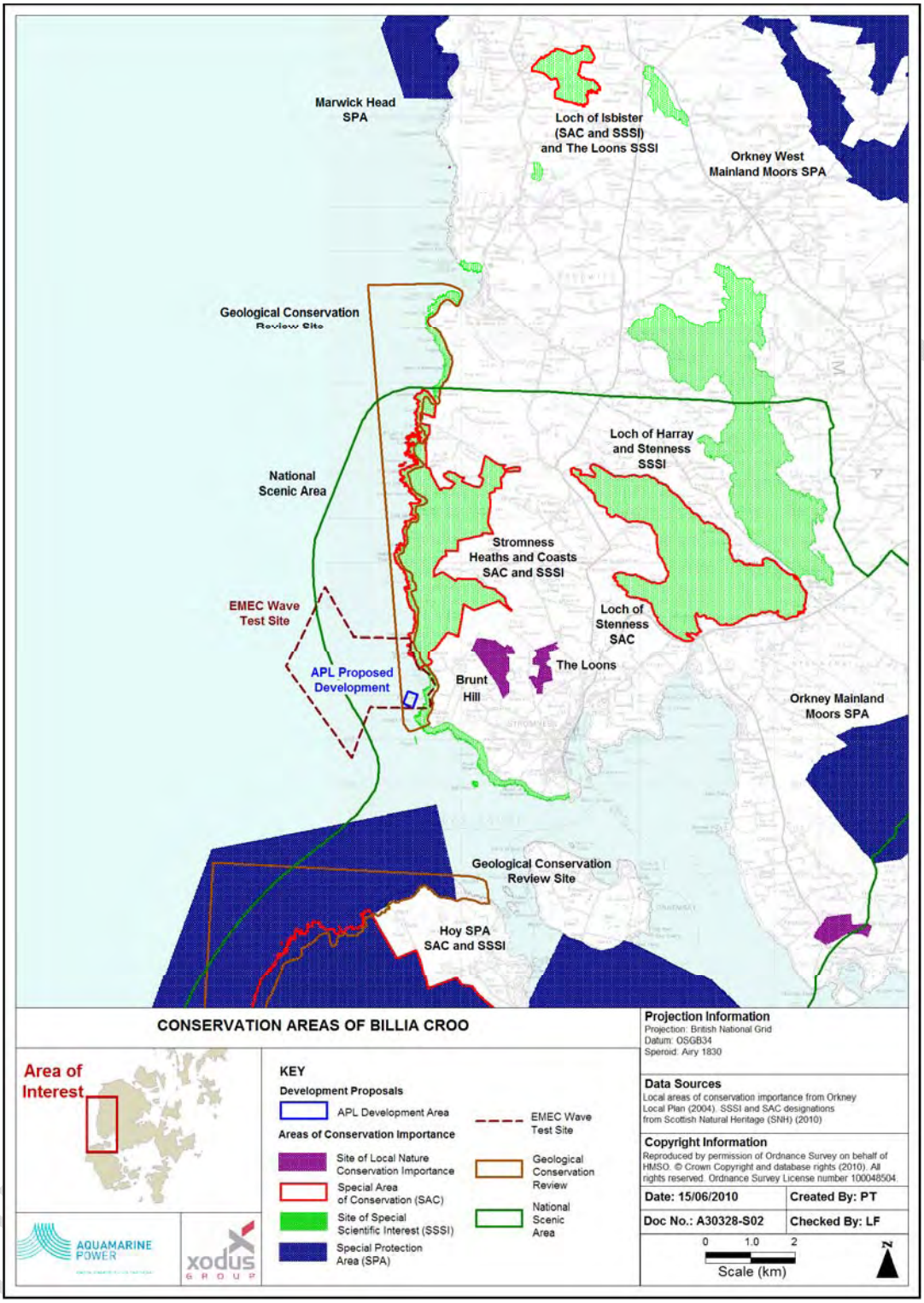

Figure 4 Proximity of Oyster 2 to designated areas (SSSI/SAC/SPA)

3.6 Other Relevant Information

As noted in Section 3.4.1, as part of the application for the licences required to deploy Oyster 2a and the foundation piles, environmental information was collated in an Environmental Supporting Document[4] and submitted to the regulators. The licences gained are included in Table 2 below.

Licence	Number	Date of issue/ Re-Issue
Coastal Protection Act (CPA), 1949 • Marine Works • Moorings	2SPC\1\9\19	29 October 2010
Food and Environment Protection Act (FEPA) 1985, Part II (as amended): Deposits in the Sea	03987/10/0-4849	21 December 2010
FEPA Licence Amendment	03987/11/0-4849	30 March 2011
European Protected Species Licence	MS EPS 01/2011	03 May 2011

Table 2 Licences Granted for Oyster 2a and Foundation Piles at EMEC

4. DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

4.1 Overview

Table 3 details the equipment to be installed for Oyster 2, Phase 1.

Component	Description
1. Oyster 2a WEC	
• Flap (x1)	26 m wide (parallel to shore), 6 m long (perpendicular to shore), 12 m high (vertically) (hinge axis depth ~ 9 m below mean sea level) Carbon steel – 300 tonnes Glass reinforced plastic – 20 tonnes
• Baseframe (x1)	2 units - 20 m long x 3 m wide x 6 m high units (separated by 29 m centre to centre) 2 cross-frames along the width of the device connecting the 2 units Baseframe up to 8m height above seabed depending on seabed slope Carbon steel - 350 tonnes

[4] Xodus Aurora (2010) Oyster 2 Project, Offshore Supporting Document for Deployment of 800kW Device OY02-DES-RH-XOD-REP-0001

Component	Description
• Hydraulic modules (x 4)	5 m long, 1.5 m wide (approximate dimensions) Two modules on each side of the Oyster Carbon steel – 90 tonnes
2. Steel Piles (x 4)[5]	4 carbon steel piles – 720 tonnes (maximum) Cement based grout – 630 tonnes (maximum)
3. Pipe Spool Assembly (x1)	This connects the WEC to the pipelines to shore Carbon steel - 40 tonnes
4. Concrete Mattresses (x20)	20 mattresses (6m x 3m) may be used to protect the pipelines between the Oyster WEC and the pipelines to shore - 3600kg
5. Rock Anchors (x2)	These may be installed on the shore side of the device 1.0 tonnes steel and <10 litres gap filling injection mortar
6. Gap Closure Gabions	These may be used to close the gap between the Oyster WEC and the seabed – stone (273 m3)and sandstone (154 m3)
7. Can Buoys (x4)	4x 500kg and frames 4 x 2000kg
8. Ground Chain (x4)	4x 20 metres

Table 3 Oyster 2a and Piles Equipment to be Installed

Oyster 2, Phase 1 does not involve the connection of any power cables from shore to the device at sea. The Oyster device pumps water along pipelines to the hydro-electric power station location onshore thereby enabling all electrical conversion to take place in the land-based substation (see also Figure 1). The pipelines are directionally drilled from the shore, under the seabed to arise at the Oyster 2a location. The pipelines will remain in place (under the seabed) following decommissioning. A control and data umbilical will be installed following the directionally drilled pipelines.

A Schematic Drawing of Oyster 2a showing the expected cut on each pile is illustrated in Figure 5.

[5] N.b. The original FEPA application was for 6 piles (2 per Oyster 2 WEC), however the design has changed such that only 4 piles (2 piles for Oyster 2a, a monopiles for Oyster 2b and a monopile for Oyster 2c) will be installed in 2011

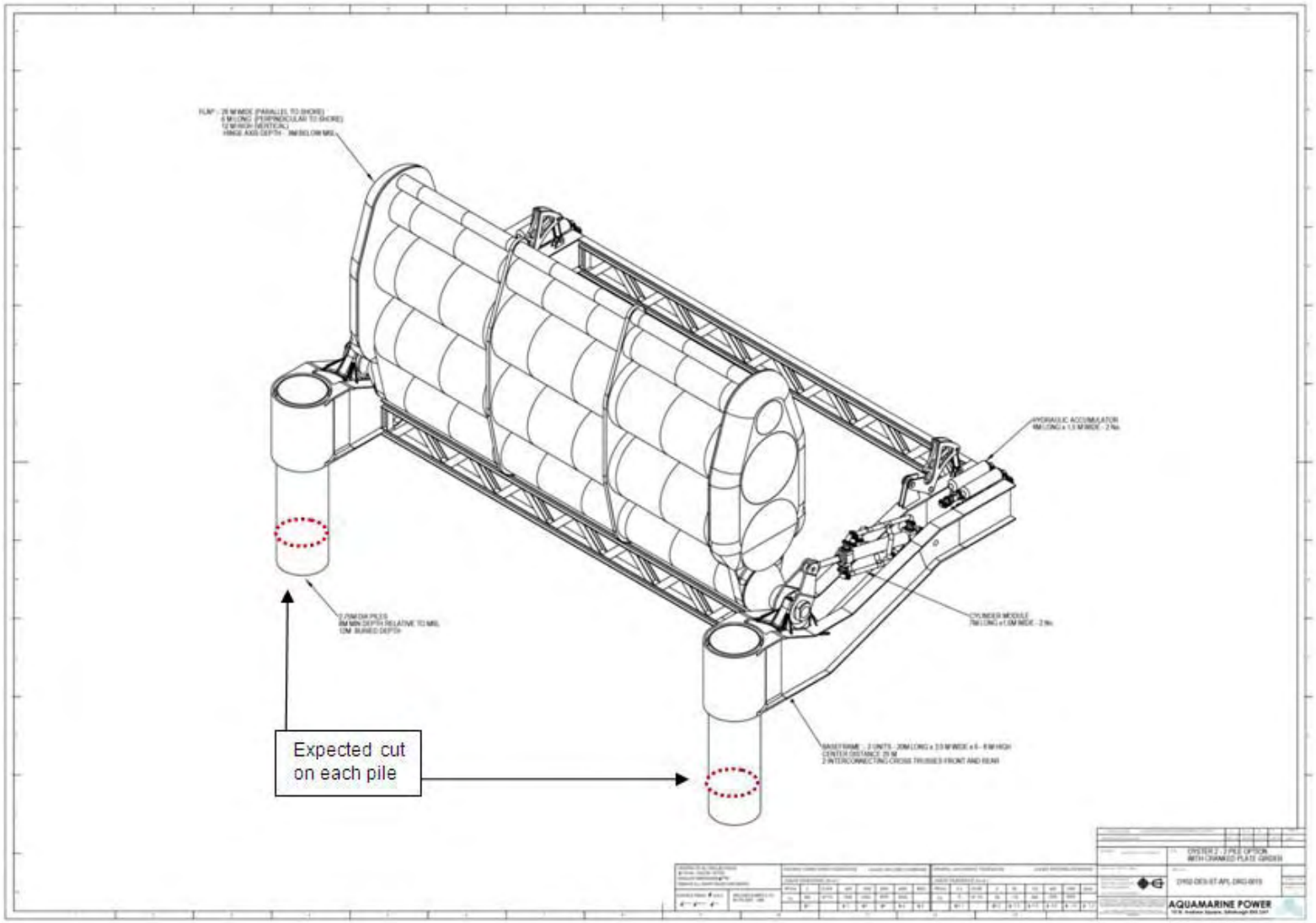

Figure 5 Oyster 2a Schematic Drawing

4.2 Oyster 2a WEC

The Oyster 2a WEC as shown in Figure 5 is made up of four hydraulic modules (two including hydraulic cylinders and two containing hydraulic accumulators), a baseframe and a flap. It is a buoyant device with the buoyancy being provided by the tubes in the flap. The buoyancy of the WEC flap is determined by the amount of water/air allowed into the flap chambers via the inlet/outlet valves. The WEC is made of Carbon Steel and Glass Reinforced Plastic. Principal dimensions of the WEC are shown in Table 3.

The WEC is designed such that it can be restrained in the closed position (as shown in Figure 6) or in the 180 degree open position. During installation and removal/decommissioning of the WEC the flap will remain in the closed position as shown in the scale model in Figure 6 and is designed to be wet towed.

Figure 6: Scale Model Oyster 2a WEC in Closed Position being wet towed

It is noted that in the event of catastrophic device failure resulting in positively buoyant components becoming detached; Aquamarine Power will implement its Emergency Response Plan (ERP) and safety procedures including immediate communication to the Maritime and Coastguard Agency (MCA) to ensure mariners are informed as quickly as possible. Aquamarine Power's ERP will be compatible with the existing EMEC site ERP.

To mitigate such an eventuality, the device is undergoing independent Third-Party Verification (TPV).

4.3 Foundation Piles (x4)

There will be four steel foundation piles of varying sizes (see Table 4) which are drilled and grouted into the rock seabed. The piles provide a secure and level base on the seabed at around 13 m (MSL) or 11 m LAT water depth. The Oyster 2a device will be fixed in position on the seabed using the two foundation piles installed for Oyster 2a. The monopiles will be used to fix Oyster 2b and 2c WECs on the seabed in 2012 and 2013.

Pile Number	Pile Diameter (metres)	Pile Length (metres)[6]
1 (for Oyster 2a)	2.75	12
2 (for Oyster 2a)	2.75	12
3 (for Oyster 2b)	4	~15
4 (for Oyster 2c)	4	~15

Table 4 Oyster 2a and Foundation Piles - Equipment to be Decommissioned

Foundation piles installed for the Oyster 2a device will protrude 4.5 to 6.5 metres out of the seabed and monopiles installed for Oyster 2b and 2c will protrude 0.5 to 2.5 metres out of the seabed.

4.4 Pipe Spool Assembly

The high and low pressure pipelines are directionally drilled from the shore, under the seabed and will arise at the Oyster 2a location. A small length of these pipelines will be laid on the seabed for a distance of approximately 25 metres to connect the Oyster 2a WEC to the directionally drilled pipeline exit point. The pipe spool assembly connects the Oyster 2a WEC to the directionally drilled pipelines to the shore. The pipelines are 14 inches and 12 inches in diameter and are secured to the seabed by a trestle structures.

4.5 Concrete Mattresses

A number of ballasted rock mattresses (approximate sizes shown in Table 3) may be used to protect pipelines between the directionally drilled pipeline exit point and the Oyster 2a WEC.

4.6 Rock Anchors

A number of rock anchors may be installed in the seabed to the sides of the Oyster 2a WEC location. These will be drilled and secured into the seabed with injection mortar filling using divers for installation and used to assist in securely and safely installing and decommissioning the Oyster 2a device onto its foundation piles.

4.7 Gap Closure Gabions

The gap between the baseframe of the Oyster 2a WEC and the seabed will be filled using gabions which are cages filled with rocks (sizes shown in Table 3). A typical gabion system is shown in Figure 7.

[6] Please note that the length of the pile is the buried length (i.e. what will be in the seabed)

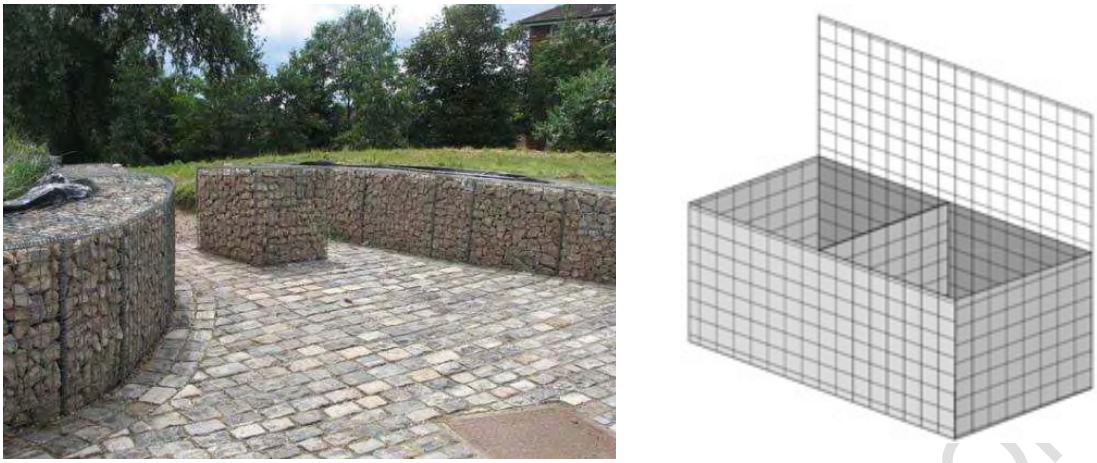

Figure 7 Typical Gabion System

The gabions can be manufactured in a range of shapes and sizes. The gabions will be lowered onto the seabed using a crane on a construction vessel. Divers would then be used to visually guide the gabions into the correct location.

4.8 Can Buoys and Ground Chains

Can buoys to be used for moorings during operations and maintenance of Oyster 2a WEC will be bolted to the seabed using anchor frames.

5. DESCRIPTION OF PROPOSED DECOMMISSIONING MEASURES

5.1 Any Planned Phasing/Integration

There is currently no plan to phase/integrate decommissioning activity between Aquamarine Power and other operators at the EMEC test centre. As each operator has a unique schedule of operations and start/end date of lease term for the test berth, it is unlikely that joint decommissioning plans would be suitable. However, should such an opportunity present itself, be of mutual advantage (e.g. vessel hire, contracting activities) and be agreeable to EMEC, Aquamarine Power may look to explore this option further.

It is expected that the Oyster 2b and 2c WEC (Phase 2 of the Oyster 2 Project, which will be subject to a separate Decommissioning Programme) would be decommissioned at the same time as Oyster 2a and the foundation piles.

5.2 Proposed Method of Removal

As is the case throughout the development process, from design and fabrication, through installation and operation, the method of decommissioning has been considered with due regard to the Best Practicable Environmental Option (BPEO), i.e. the option which provides the most benefit or least damage to the environment as a whole, at an acceptable cost, in both the long and short term.

Aquamarine Power places Health and Safety as its number one priority. As with installation, where it is possible to either eliminate or mitigate the risk to people and the environment, Aquamarine Power will pursue this option. This principle has been fed through the design

process, for example the device and foundation piles have been designed to minimise the need to use divers for installation and decommissioning activities.

In undertaking the decommissioning programme, Aquamarine Power will meet all requirements for navigational safety, environment protection and health and safety in accordance with current relevant legislation and as specified under the FEPA, CPA and EPS Licences granted for Oyster 2a and foundation piles (see Table 2). Final decommissioning plans will be informed by navigational risk and safety assessments and will implement methods for risk elimination and mitigation.

The phases of decommissioning for Oyster 2a and the foundation piles will be as follows:

- A notice to mariners will be issued announcing the nature and timing of the decommissioning works.
- A temporary safety zone and navigational markers will be established in accordance with marine safety legislation.
- It is expected that a guard or safety vessel will be deployed with recovery capability for personnel, equipment and device components should any unexpected failure or incident require intervention. If requested by the Northern Lighthouse Board (NLB), a radar and visual watch would be kept during the decommissioning period.
- Decommissioning vessels will be mobilised to site. The vessels used in the operations (see Table 5) will be lit and marked as per the International Regulations for the Prevention of Collisions at Sea, 1972.
- The Oyster 2a device will be latched closed for safety.
- The connecting high and low pressure pipelines (from the shore to the Oyster 2a device) will be cut.
- Divers shall be used to connect suitable rigging to the concrete mattresses and each will be recovered in a single unit to the deck of the decommissioning vessel. Divers will stand clear of the lift area at such times as mattresses are being recovered.
- The pipelines and pipe spool assembly will be rigged to the decommissioning vessel crane by divers and recovered individually to the vessel deck.
- Any grout or sandbag supports will be recovered using a mechanical grab or cargo nets. All items will be recovered to deck.
- Towing bridles are attached to the WEC and to the vessel tow winches.
- The Oyster 2a WEC will be made partially buoyant, by blowing water out from selected flap chambers.
- Divers will set up remote cutting equipment which will cut the foundation piles under the WEC and as close to the seabed as possible.
- The Oyster 2a WEC and piles will rise to the surface once the piles have been cut.
- The WEC will be towed back to the on-shore demobilisation dis-assembly point.
- The two monopiles associated with Oyster 2b and 2c will be cut by remote tooling setup by divers as close to the seabed as possible.
- All waste produced during the decommissioning phase will be removed from the site onboard the decommissioning vessel.
- Post decommissioning seabed surveys will be carried out in line with the EMEC contract and FEPA consent conditions.

Vessel	Number of Days on site during decommissioning
Tug	3
Multi-cat	8
Dive Team	15.5

Table 5 Decommissioning Vessels

5.3 Proposed Waste Management Solutions

Waste management will be carried out in accordance with all relevant legislation at the time of decommissioning. In the first instance, Aquamarine Power will consider the possibility of reuse of the device and materials (see Table 3); followed by consideration of recycling, incineration with energy recovery and, lastly, disposal; in alignment with the waste hierarchy.

As the device is still in the stages of early research and development design, it is unlikely that the individual components will be reused in subsequent generations of devices; the design of the latter being significantly changed and improved. Largely being composed of metal, the Oyster 2a WEC will be broken down and scrapped; enabling the potential reuse of the material via melting and recasting.

The gabions would be deconstructed onshore, removing the stone content, which could have numerous reuses including as hardcore or as gabions in future projects. The gabion cage itself is composed of galvanized wire, which subject to its condition could be recycled.

5.4 Items that May Remain in Situ Following Decommissioning

Aquamarine Power notes that there is a general presumption in favour of disused installations being removed. It is proposed that following decommissioning no items will remain in situ.

The high pressure and low pressure pipelines will be cut flush with the seabed and will remain in the directionally drilled hole. The four foundation piles will be cut flush with the seabed and will remain. The reason for leaving the pipelines and the piles cut flush with the seabed are that the entire removal of these items would involve an extreme cost and would be likely to cause a negative impact on the environment by removing from the marine environment.

5.5 Predicted Degradation, Movement and Stability of any Remains

Assuming that the Oyster 2a WEC and foundation piles are removed as currently planned, the only remains will comprise the piles and pipelines, which will have been cut back to be flush with the seabed surface. There is no expected movement of these subsurface piles, being held firmly in place by the surrounding bedrock. The seabed surface is composed of bedrock with little loose sediment, including in the vicinity of the pile and pipeline locations. It is therefore not anticipated that that there will be any scouring issues over the long term. As a result, scour pits are not expected to form and therefore there will be no requirement for filling or treating.

6. ENVIRONMENTAL IMPACT ASSESSMENT

As the Oyster 2a WEC is rated at 800kW an Environmental Impact Assessment (EIA) in support of a Section 36 application was not required for this project. However, a series of environmental assessments were undertaken to an EIA standard and submitted with the applications for a FEPA and CPA Licence in an Environmental Supporting Document[7]. This was prepared by environmental consultants Xodus Aurora and reported no potential for significant adverse effects on the environment during decommissioning activities.

7. CONSULTATIONS WITH INTERESTED PARTIES

In accordance with the Notice under Section 105 of the Energy Act 2004 Decommissioning of Offshore Installations (received from DECC on 07 March 2011), Aquamarine Power will undertake consultations with the following statutory consultees:

- Scottish Fishermans Federation
- Scottish Fisheries Protection Agency
- Marine Scotland
- Chamber of Shipping
- Royal Yacht Association (Scotland)
- Joint Nature Conservation Committee
- Scottish Environment Protection Agency
- Historic Scotland
- Maritime and Coastguard Agency
- Northern Lighthouse Board
- Orkney Harbours
- Orkney Islands Council
- Royal Society for the Protection of Birds
- Scottish Natural Heritage
- Orkney Fisheries Association
- Orkney Fishermen's Society
- Orkney Dive Boat Association
- European Marine Energy Centre

A copy of the this draft DP has been emailed to the consultees above and Aquamarine Power has also made this available publically on the company website: www.aquamarinepower.com and on the EMEC website.

The consultation period is 30 days long and will commence on **Friday 15th July 2011** and end on **Monday 15th August 2011**.

Please send any comments to megan.richardson@aquamarinepower.com. The draft DP will be updated to take account of any comments and/or information gained from consultees.

[7] Xodus Aurora (2010) Oyster 2 Project, Offshore Supporting Document for Deployment of 800kW Device OY02-DES-RH-XOD-REP-0001

8. COSTS

This information is commercially sensitive and therefore not included in this draft for consultation.

9. FINANCIAL SECURITY

This information is commercially sensitive and therefore not included in this draft for consultation.

10. SCHEDULE

The design life of Oyster 2a and the foundation piles is 20 years. The current seabed lease with EMEC expires in 2015, so at this stage it is expected that decommissioning would take place in summer 2015 and finish in summer 2015. Subject to a lease extension being granted by EMEC, then decommissioning activities would commence in summer 2026 and finish in 2026

The total duration of the decommissioning programme will be similar to the installation programme. The approximate schedule for the programme is detailed as follows, and is based on the schedule created for the installation programme:-

- Paperwork, method statements, risk assessments, permits etc (20 days)
- Tooling design & preparation (20 days)
- Vessel Mobilisation to site (3 days)
- Removal of Hook-Up pipeline (3.5 days)
    - Divers removal pipeline stabilisation equipment (1.5 days)
    - Divers cut & recover interconnecting pipes (2 days)
- Removal of 2A WEC & 2B&C Piles (4 days)
    - Divers attach recovery rigging & cut piles & inspect foundations (3 days)
    - Removal of WEC and foundation piles by wet tow (1 day)
- Seabed reinstatement (2 days)
    - Divers perform final cutting of piles flush to sea bed if necessary (2 days)
- Vessel demobilisation (3 days)

The outline schedule above assumes that there are no poor weather days. An assumption of 30% downtime will be scheduled for operations which could be potentially hampered by poor weather conditions.

11. PROJECT MANAGEMENT AND VERIFICATION

When final review of the DP takes place towards the end of the installation's life, information will be provided on how Aquamarine Power will manage the implementation of the decommissioning programme and provide verification to Government concerning progress and compliance. In accordance with Annex E of the DECC Decommissioning Guidance Notes for

Industry[8], this will include a commitment to submit a report, detailing how the programme was implemented. It is intended that this report will be submitted within 4 months of completion of decommissioning.

12. SEABED CLEARANCE

During the decommissioning of the Oyster 2 device all waste produced will be removed from the site onboard the construction vessels (see Section 5). In completion of the Oyster 2, Phase 1 decommissioning programme, the site will be restored (see Section 13) such that no objects or protrusions will be present above the seabed surface and no debris posing a hazard to the marine environment or navigation shall remain.

13. RESTORATION OF THE SITE

Aquamarine Power will restore the site to the same condition as it was prior to the commencement of the installation works. A seabed video will be provided as evidence that restoration has been concluded to the satisfaction of the regulators and confirming that there are no remains or debris that could cause a hazard to the marine environment or pose risk to navigation.

14. POST DECOMMISSIONING MONITORING, MAINTENANCE AND MANAGEMENT OF THE SITE

Following decommissioning, post-decommissioning seabed survey and restoration of the site by Aquamarine Power there would be no further monitoring, maintenance or management of the site.

15. SUPPORTING STUDIES

Supporting studies include:

- Xodus Aurora (2010) Oyster 2 Project, Offshore Supporting Document for Deployment of 800kW Device OY02-DES-RH-XOD-REP-0001 (this includes a navigational safety risk assessment)

[8] DECC (January 2011) Decommissioning of offshore renewable energy installations under the Energy Act 2004