

## PROJECT SITE METADATA SURVEY FORM

Name of person updating the form

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Date submitted

March 30, 2016

**Project Name: Wave Dragon Project - Milla Fjord Site**

Planned

In-Operation

Completed

Canceled

**Project Description:**

*Project Developer:* Wave Dragon Wales Ltd.

*Technology Developer:* Wave Dragon ApS

*Technology type:* Overtopping device

*Resource (wave, tidal):* Wave

*Project scale (test site, prototype, array, commercial):* Full-scale prototype

*Installed capacity (MW):* Up to 112 MW (installed in groups of 28MW)

*Project Website:* <http://www.wavedragon.net/>

*Launch Date:* TBC

*End Date (if applicable):* N/A

*Additional Description:* The Wave Dragon technology is a floating slack moored wave energy converter. It is moored (like a ship) in relatively deep water, i.e. more than 40 m to take advantage of the ocean waves before they lose energy as they reach the coastal area. The device allows ocean waves to overtop a ramp, which elevates water to a reservoir above sea level. This artificial 'head' of water is subsequently released (through gravity alone) through a number of turbines and in this way transformed into electricity. Water is returned to the sea through draft tubes in the base of the unit, which house the turbines, the only moving parts of the device. The unit comprises a central platform, with a curved ramp and a large water reservoir equipped with an array of hydro turbines, and two lateral curved wave reflecting wings which concentrate the power of incoming waves. The Wave Dragon device is designed to remain within a defined movement area regarding wave direction and tidal currents. It is fixed to a forward buoy that remains essentially stationary (in plan view). The mooring system of the device is feature between six and eight concrete gravity mooring blocks and a series of catenary mooring lines (steel chains) fixed to a buoy.

**Location:** The site is approximately 20km off the Pembrokeshire Coast south west of the opening to Milford Haven estuary, in the south west tip of Wales, U.K.

*Coordinates:* Confidential

Process Status: See the [Wave Dragon Pre-Commercial Demonstration Project](#) for technology history.

Surveys have been taken of the Milla Fjord site during 2013 and 2014. Side scan multi beam sonar, ship-based ADCP water column data, and a range of radar and acoustic profiles have been taken. Physical sampling was also taken. Geophysical data was taken at both surveys and geophysical results have been drawn from comparison between both surveys.

Both survey results are being analysed and compared as well as the physical samples taken.

Licensing Information: No formal applications have yet been made.

Key Environmental Issues: These will be drawn from the data and environmental designations of surrounding locations. However at the time of writing the site is within a proposed European Special Protection Area as (to be) designated under the European Birds Directive (as enacted into UK Law). Thus a thorough EIA / Environmental Monitoring program will be undertaken.

Environmental Webpage:

[http://www.wavedragon.net/index.php?option=com\\_content&task=view&id=5&Itemid=6](http://www.wavedragon.net/index.php?option=com_content&task=view&id=5&Itemid=6)

#### Baseline studies and project effects studies: Wave Dragon Project - Milla Fjord Site

| General description                   |  |                    |         |   |
|---------------------------------------|--|--------------------|---------|---|
| Data is not yet in the public record. |  |                    |         |   |
| Receptor                              | Study description including question and/or objective (several can be listed per receptor) | Design and methods | Results | Status (planned, underway, completed, with dates) |
| Physical environment                  |  |                    |         |   |
| Benthos                               |  |                    |         |   |
| Fish and fisheries                    |  |                    |         |   |
| Large vertebrates                     |  |                    |         |   |
| Birds                                 |  |                    |         |   |
| Marine uses / users                   |  |                    |         |   |
| Other* (can be named)                 |  |                    |         |   |
| Reports or Papers                     | N/A  |                    |         |   |
| Research Projects                     | N/A  |                    |         |   |

**Monitoring and adaptive management: Wave Dragon Project - Milla Fjord Site**

|                            |  |                           |                |  |
|----------------------------|--|---------------------------|----------------|--|
| <b>General description</b> | Data is not yet in the public record.  |                           |                |  |
| <b>Receptor</b>            | <b>Monitoring program description including question and/or objective</b> (several can be listed per receptor) | <b>Design and methods</b> | <b>Results</b> | <b>Status</b> (planned, underway, completed, with dates) |
| Physical environment       |  |                           |                |  |
| Benthos                    |  |                           |                |  |
| Fish and fisheries         |  |                           |                |  |
| Large vertebrates          |  |                           |                |  |
| Birds                      |  |                           |                |  |
| Marine uses/ users         |  |                           |                |  |
| Other* (can be named)      |  |                           |                |  |
| <b>Reports or Papers</b>   | N/A  |                           |                |  |
| <b>Research Projects</b>   | N/A  |                           |                |  |