South Irish Sea
Positive Energy for a Sustainable Future

SITE INVESTIGATION BRIEFING DOCUMENT

August 2021 Update

energia
Renewables

1. SURVEY TIMINGS

All of the surveys set out in this document (apart from the aerial bird and mammal surveys) require a Foreshore Licence from the Department of Housing, Local Government & Heritage. Therefore, the timings set out in this document are indicative only at this stage and can only be confirmed once a Foreshore Licence is issued by the Department and a survey contractor has been appointed.

2. SITE INVESTIGATION SURVEYS

A series of geophysical and geotechnical surveys will be undertaken to allow us to measure water depth, to identify seabed features (e.g., sand waves, reefs, archaeological features), to determine seabed sediment type and distribution (sand, mud, gravel, rock) both on and below the seabed. We will also be carrying out ecological surveys to determine the ecology on and in the seabed and in the water column. Oceanographic and hydrographic data on wind speed, current speed and direction and wave height will also be recorded.

2.1. GEOPHYSICAL SURVEYS (NON-INTRUSIVE SURVEYS)

Geophysical surveys allow for the accurate prediction of the type of material present on the seabed (e.g., rocks, pebbles, sand/mud). Geophysical surveys involve using acoustic devices to emit sound energy towards the seabed. These sound waves are reflected, and the returning echoes are then detected on board the vessel. Different echo strengths and return speeds indicate different seabed features and different physical characteristics. A typical survey vessel can be seen in Figure 1.

2.1.1. A multibeam echosounder

A **multibeam echosounder** (MBES) is a remote sensing device (see Figure 2) which uses sound waves to measure water depth and sediment type. This is anon-intrusive survey type and is commonly used around the coast of Ireland. The image to the right is a schematic of a MBES survey being carried out.

Figure 1

2.1.2 . Side scan sonar

Side scan sonar (see Figure 3) is a remote sensing acoustic device produces high-resolution mapping of the seabed in order to investigate particular features,

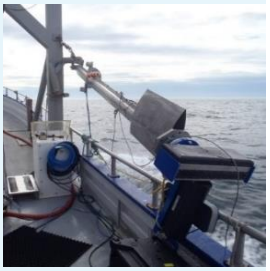
Figure 2

2.1.3. Magnetometer

A **magnetometer** (see Figure 4) is a passive remote sensing device that detects magnetic fields from ferrous objects such as lost anchors, sunken ships, and buried pipes on/in the seabed. It is towed behind or alongside the survey vessel. This again is a non-intrusive survey type and is in common use around the coast of Ireland.


Figure 4

Figure 3

2.1.4. Sub bottom profiling / shallow seismic

Sub bottom profiling / shallow seismic provides information on the rock and sediment layers beneath the seabed. It is towed behind the vessel. Some examples of commonly used sub bottom profilers can be seen in Figure 5.

Over the last number of years both INFOMAR and the Marine Institute carry out these types of surveys on a regular basis all around the Irish coast.

The precise requirements of the geophysical survey have not yet been determined. Depending on the size of the final survey area, it is anticipated that the geophysical survey may take up to 3 months to complete. The optimal months of the year for suitable weather conditions to conduct these surveys extend from March to September. Surveys were originally anticipated to occur in 2021 however, this was subject to the grant of a Foreshore Licence. An updated timeframe will be provided when the Foreshore Licence is granted and a survey contractor has been appointed.

The survey lines and timelines will be discussed in advance with local fisheries interests and a Notice to Mariners ("NtM") will be published in advance of the survey.

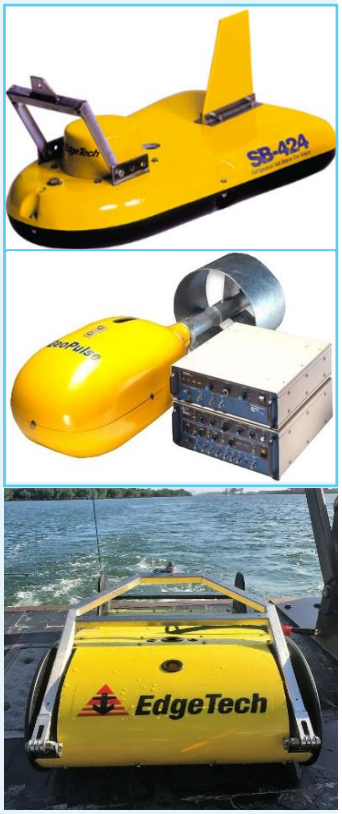

Figure 5

2.2. GEOTECHNICAL SURVEYS (INTRUSIVE SURVEYS)

In order to confirm the predictions from the geophysical surveys, representative samples of the seabed need to be collected (ground-truthing). When the term intrusive is used, it is indicating that a piece of equipment is used in order to recover a sample from the seabed. Samples can be collected by grab or core samplers. Grab samplers (see Figure 6) collect samples to 20cm depth, gravity/box corers (see Figure 7) collect samples down to 40cm depth. These samplers fall under their own weight.


Figure 6


Figure 7

2.2.1. Vibrocore

A **vibrocore** (see Figures 8 & 9) penetrates to 6m deep. A vibrocorer uses an electrical motor that creates vibrations that allow a metal cylinder to penetrate the soft seabed. Cores are up to 15cm in diameter. This, while it does penetrate the seabed, is less than 6 inches in diameter and will backfill very quickly once the core sample is extracted.

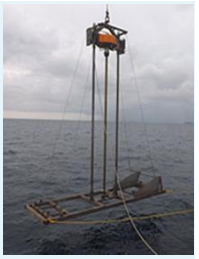

Figure 8

2.2.2. Piston corer

Piston corers (see Figure 10) can collect sediment from 15 to 30m deep, with a core diameter of c. 6.5cm. Piston pushes core into seabed. Once the core has been retrieved the seabed will backfill again very quickly.

Figure 9

2.2.3. Boreholes

Boreholes are drilled into seabed (see Figure 11). The depth of drilling depends on ground conditions at each location and will be determined once further detail of the surveys are available, however, they are expected to be in the region of 20-70m deep, with a hole diameter of c.15cm.

It is envisaged that a Jack-up barge (see Figure 12) or DP2 vessel will be used to achieve the boreholes.

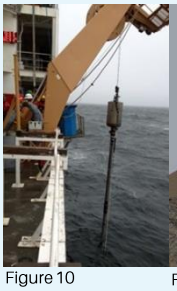

Figure 10

Figure 11

2.2.4. Cone penetration testing

Cone Penetration Testing (CPT) is widely used for *in-situ* geotechnical characterisation of the ground. The testing is performed with a cylindrical penetrometer with a conical tip (cone) pushed into the ground until it meets resistance (see Figure 13). The example shown right is lowered to the seabed and the CPT operation is controlled from the surface vessel.

Figure 12

2.2.5. Trial pits

Trial pits are excavated in the intertidal zone, 3m x 1m and 5m deep. They are typically dug using an excavator (either from a boat of from land depending on access). The pits are fully reinstated immediately upon completion. Trial pits will be requiredin areas being examined for landfall sites (up to 10 trial pits per landfall site).

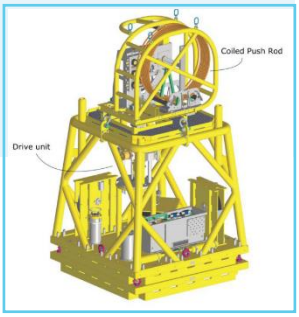

Figure 13

The location(s) will be discussed in advance with local fisheries interests and a NtM will be published in advance of the survey.


Figure 14

3. OCEANOGRAPHIC & HYDROGRAPHIC SURVEYS

Wind speed will be recorded from a floating wind lidar buoy, an example of which can be seen in Figure 14. It will sit on the sea surface and be moored to the seabed. If required for navigational safety reasons, it will be accompanied by a marker buoy. Both buoys will be appropriately lit and marked in accordance with the requirements of Commissioner of Irish Lights. The location(s) will be discussed in advance of installation with local fisheries interests and will be published in a NtM. It is anticipated that the Lidar buoy will be installed in 2022 for a period of 12-24 months.

Current speed and direction and wave height will be recorded by an ADCP (Acoustic Doppler Current Profiler) which will be bottom mounted in a trawl resistance frame, examples of which are shown in Figures 15 & 16. Indicative frame dimensions are 1.5m wide by 1.5m long and c. 0.5m high. It may be marked at the surface by a buoy or an acoustic release maybe used (no surface marker). Up to 4 locations may be monitored using an ADCP. The locations will be discussed in advance with local fisheries interests and will be published in a NtM.The wave and current measurement campaign may extend for a period of up to 24 months and it is anticipatedthat an initial deployment will occur in 2022.

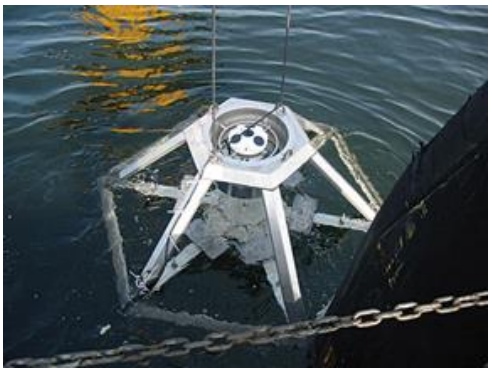

Figure 15

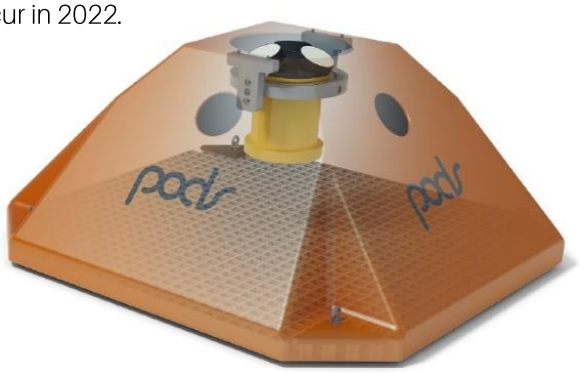

Figure 16

4. ECOLOGICAL SURVEYS

The marine based ecological surveys include the following:

Monthly aerial seabird and marine mammal surveys are carried out across the site each month from a suitable aircraft (Figure 17). High-definition digital video cameras record all seabirds and marine mammals along each surveyed transect (Figure 18). Marine and seabird surveys have been ongoing since 2020 off the coast of Co. Wexford and south Co. Wicklow and will continue for at least a further 12 months.

Acoustic listening devices (e.g. C-PODs or similar) will be deployed at up to four locations across the site to record marine mammal presence in the area. A C-POD can be seen in Figure 19 and it can be deployed using an acoustic release (also seen on the right) with sacrificial mooring or standard bottom mooringwith surface marker buoy. These C-PODs will be attached to a clump chain and raised approximately 3m off the seabed. A sound-trap (to record underwater sound) may be deployed alongside one or more of the C-PODs for periods throughout the monitoring campaign. The locations will be discussed in advance with local fisheries interests and will be published in a NtM. The C-PODs will be recovered every three months to download the data and change the batteries. The initial deployment of C-PODs is anticipated for 2022 and monitoring may be required for a period of up to 24 months.


Figure 17

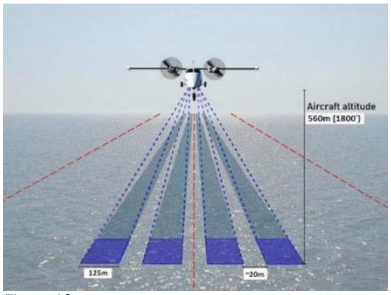

Figure 18

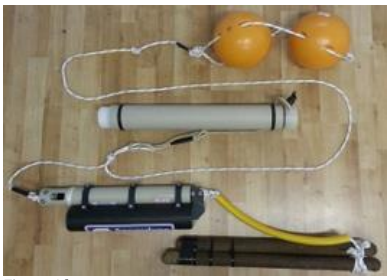
Figure 19

4.1 Subtidal habitat assessments

Subtidal habitat assessments will be carried out using a variety of methods depending on sediment type, habitat type and depth. These surveys may include grab/dredge sampling, sediment profile imagery (SPI) survey, drop-down video/ROV survey and SCUBA dive survey. Sediment samples would be collected for faunal and sediment analysis. It is anticipated that these surveys will be carried out in Q2/Q3 2022 and would be completed over a number of days.

4.2 Intertidal surveys

Intertidal surveys would be carried out on foot between the low and high-water mark in locations being examined as potential cable landfall sites. It is anticipated that up to 3 potential locations would be surveyed. Each location would be typically surveyed in 1 day. Sediment samples would be collected for faunal and sediment analysis. It is anticipated that these surveys will be carried out in Q2/Q3 2022.

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Images Sources: Chelonia – Figure 19; EdgeTech – Figure 5; Fugro – Figures 11, 12, 13 & 14; Geometrics – Figure 4; HiDef Aerial Surveying Ltd. – Figures 17 & 18; Infomar - Figures 6, 7, 9; International Ocean Systems – Figure 15; Kongsberg – Figure 5; MS Geotech - Figure 8; Pods – Figure 16; R2Sonic - Figure 2; USGS – Figures 3 & 10; XYZ Offshore - Figure 1