ENVIRONMENTAL EFFECTS METADATA SURVEY FORM

Name of person updating the form	Date submitted
Nathan Cox (Plymouth University)	June 2012

Project name: Torr Head project

☒ Planned ☐ In Operation ☐Completed

Project description:

Project Developer: THETIS Energy Ltd

Technology Developer: THETIS Energy Ltd

Technology type: Tidal devices

Resource (wave, tidal): Tidal

Project scale (test site, prototype, array, commercial): Approximately 100 devices (between 1 MW and 2 MW) proposed

Installed capacity (MW): Capable of 100-200 MW

Project Website: http://www.thetisenergy.com/

Launch Date: TBD

Additional Description: The Torr Head Tidal Scheme (the "Project") has been proposed by THETIS Energy Ltd to utilise the strong tidal resource on the north east coast of Northern Ireland for electricity generation. The scheme is proposed to have a target capacity of around 100-200 MW, consisting of an array of approximately 100 underwater horizontal axis turbines, each with a generating capacity of between 1 and 2 MW. The project scope of works will include the installation of the turbines and their foundations, sub-sea export cables, ancillary onshore works and the connection of the generating station to the onshore electricity distribution network.

Location:

Ocean/Water body: Torr Head, Northern Ireland

Closest city:

Country: Ireland

Depth: Water depth 20 m

Coordinates (please use Mercator): 55.199353°, -6.060508

Process status: Following a review of the available resource assessment data, a number of zones around Northern Ireland with the potential to support marine tidal development were identified. The north east coast of Northern Ireland was identified to have the potential to support a commercial scale marine tidal turbine array. Following a successful location selection, an area southwest of Fair Head and north of Runabay and extends from the 20m water depth contour to approximately 5km from the shoreline was chosen for development:

The results of the scoping exercise in stage 2 outlined above will determine the area over which EIA baseline survey and conceptual engineering design studies will be conducted.

The project details from stage 3 outlined above will be used to draft the Environmental Statement, which will support the applications for Article 39 consent and FEPA licensing. It should be recognised that the final site area will be a smaller area than the area of interest for scoping. Currently the scheme is undergoing development before commencing.

Licensing information (brief description): In 2009 the following applications were sent out to relevant legislation to gain approval of the Torr Head Tidal project; Northern Ireland Act 1998 (Northern Ireland has powers over the territorial sea adjacent to Northern Ireland); Electricity (Northern Ireland) 1992 (Under Article 39 of the Electricity Order 1992); Offshore Electricity Development (Environmental Impact Assessment) Regulations (Northern Ireland) 2008; Food and Environment Protection Act (FEPA) 1985; Marine Works (Environmental Impact Assessment) Regulations 2007; Planning (Northern Ireland) Order 1991; The Habitats Regulations; Marine and Coastal Access Bill; Miscellaneous issues.
In addition, a number of further licenses and consents may and are required throughout the initial stages of the scheme, some of which are outlined below:

- Consent from the NIEA for any discharges under the Water Act (Northern Ireland) 1972
- Article 40 consent under Electricity (Northern Ireland) Order 1992 for onshore grid connection works
- A Bill in the Northern Ireland Assembly may be needed to address the potential interference with the public right of navigation in the area. This procedure can normally be addresses through the FEPA licensing process

Application approval from all relevant bodies is pending.

Key Environmental issues: There are a number of conservation designations in the area around the proposed project site. These include the European designations of Special Protection Area (SPA) and Special Area of Conservation (SAC), collectively known as Natura 2000 sites, and the national designation of Area of Special Scientific Interest (ASSI). There are three sites of particular concern for the proposed project; the Rathlin Island SAC, Rathlin Island SPA and Torr Head ASSI.

The Antrim Coastline, including Torr Head and its environs, hosts a number of marine and coastal bird species. The site qualifies under the EU Directive by supporting internationally important breeding numbers of the following seabird species: Razorbill (*Alca torda*), Guillemot (*Uria aalge*) and Kittiwake (*Rissa tridactyla*). The SPA also regularly supports over 20,000 breeding seabirds including puffin

(*Fratercula arctica*), fulmar (*Fulmarus glacialis*), shag (*Phalacrocorax aristotelis*) and gannet (*Morus bassanus*).

Species Such as puffin, razorbill, guillemot, gannet and shag are diving species and forage for their food underwater and as such are more at risk from collision with the moving underwater turbines. Species which are surface feeders, such as kittiwakes and gulls may be more at risk from disturbance from vessels, as are those species which rest or moult on the sea surface.

The Irish Whale and Dolphin Group (IWDG) manage a sightings database of all cetacean sightings in Ireland, totaling 13,000 records. This cetacean sightings data indicates that Harbour Porpoise, Bottlenose Dolphin, Common Dolphin (*Delphinus delphis*) and Minke Whale (*Balaeanoptera acutorostrata*) are present in the waters around Rathlin Island and Torr Head. An acoustic survey was undertaken at a number of test sites off the north Antrim and Rathlin Island coasts in waters up to 200m water channels, approximately 10 km from the area of investigation. A number of likely Sperm Whale (*Physeter macrocephalus*) vocalizations were recorded, indicating that this species may be present in the area. However, it should be noted that sperm whales are a deep diving species and are therefore unlikely to be present close to shore in shallower waters.

The terrestrial habitats of Torr Head and its environs are typical of the North Antrim coast, which represents an extensive area of exposed hard cliff. The basalt and chalk maritime cliff and slopes represent a diverse range of communities including those associated with rock crevices and cliff ledges, and with a range of typical maritime grasslands and heath. Notable species on the basalt cliffs include Wilson's Filmy-fern (*Hymenophyllum wilsonii*), Thyme Broomrape (*Orobanche alba*), Hare's Foot Clover (*Trifolium arvense*), Zigzag Clover (*Trifolium medium*) and Common Juniper (*Juniperus communis*). The chalk cliffs support neutral and species rich calcareous grasslands. Plants present in the grassland include Pignut (*Conopodium majus*), Harebell (*Campanula species*), Kidney Vetch (*Anthyllis vulneraria*) and several orchid species.

Environmental webpage: *link to project official environmental webpage (if available)*

Baseline studies and project effects studies: Torr Head Project				
General description				
Receptor	**Study description including question and/or objective**	**Design and methods** (brief description)	**Results** (brief description)	**Status** (planned, underway, completed, with dates)
Physical Environment	Potential effects on the physical environment.	Desk based study (Literature Review).	**Construction:** The installation and construction of the proposed 100 turbines is likely to have an impact on the hydrodynamic regime in the local area sedimentary regime, possibly including SAC features. The significance of this impact will need to be	Completed

			assessed in the EIA. **Operation:** Localised scouring around the base of the tidal turbine units may cause a loss of benthic habitat or smother the existing habitat due to deepening of seabed. The degree of scour will be dependent upon the final choice of foundation design. **Decommissioning:** The removal of 100 turbines may cause a change to the hydrodynamic regime and coastal processes of the local area and is likely to lead to a return to conditions that existed prior to installation. Foundation type will influence decommissioning methods and, once defined, the extent of impacts can be assessed.	
Fish and Shellfish Ecology	Potential effects to shellfish and fish stocks.	Desk based study (Literature Review).	**Construction:** Slow moving species such as basking shark may be susceptible to vessel strike. Effects on salmonids due to reduction in water quality and noise from construction activities which may impact migration routes. **Operation:** The proposed array of tidal energy devices has the potential to impact on elasmobranches and, possibly, salmonids through the effects of the Electro Magnetic Force (EMF) associated with the electro-magnetic fields created by the generation and transmission of electricity. Sources of EMF include the offshore turbine- generators and the associated cabling linking the tidal energy devices to a sub-station. Elasmobranches use their electro-receptive organs for prey detection, navigation and orientation and thus are sensitive. **Decommissioning:** Slow moving species such as basking shark may be susceptible to vessel strike. Water quality changes may also be relevant.	Completed
Terrestrial Ecology	Potential effects to Terrestrial ecology including: Wilson's	Desk based study (Literature Review).	**Construction:** The construction of an on-shore substation of 100MW capacity will require a footprint of approximately 25m x 50m. The substation's footprint together with any further hard-standings required for site	Completed

	Filmy-fern (*Hymenophyllum wilsonii*), Thyme Broomrape (*Orobanche alba*), Hare's Foot Clover (*Trifolium arvense*), Zigzag Clover (*Trifolium medium*) and Common Juniper (*Juniperus communis*).		access will result in a permanent loss of terrestrial habitat. **Operation:** There are unlikely to be any effects to terrestrial ecology during the operational phase other than occasional maintenance visits. **Decommissioning:** It is anticipated that any land disturbed during construction of the project will be replanted and re-established as part of the decommissioning phase.	
Large vertebrates	Potential effects to large mammals.	Desk based study (Literature Review).	The key potential impacts on marine mammals from the construction and operation of the proposed tidal array development are displacement, disturbance and collision risk. Most marine mammals use sound as a means of communication, orientation and detecting prey. The presence of a noise source over and above normal background noise levels has the potential to cause direct injury or to interfere with their ability to communicate, orientate or catch prey and as such maybe be impacted by noise. Turtles are also thought to be sensitive to sound emissions.	Completed
Birds	Potential impact to bird species.	Desk based study (Literature Review).	**Construction:** Many of the species listed, puffin, razorbill, guillemot, gannet and shag are diving species and forage for their food underwater and as such are more at risk from collision with the moving underwater turbines. Species which are surface feeders, such as kittiwakes and gulls may be more at risk from disturbance from vessels, as are those species which rest or moult on the sea surface. **Operation:** There may be an impact on benthic ecology from scour effect. The extent of scour will be dependent on hydrodynamic conditions and foundation type selected. **Decommissioning:** There is potential for short term habitat loss and smothering of the	Completed

			benthic community during the decommissioning phase, due to the anchoring and positioning of decommissioning vessels and barges. Again, the extent to which this loss is significant will depend upon recoverability.	
Benthic	Potential impact to Benthic and inner tidal ecology.	Surveys of the seabed along the north east Antrim coast undertaken from 2000 to 2003.	Permanent direct loss of sub-tidal benthic habitat from the installation of tidal device foundation. The degree of Impact will vary depending on the tidal device chosen. Depending on size, a gravity base may have a greater impact than a moored or pinned device.	Completed
Reports or Papers	• THETIS Energy Ltd. (2009). Proposed Torr Head Tidal Scheme. Environmental Scoping Report.			
Research Projects	N/A			

Monitoring and adaptive management: Torr Head Project				
General description				
Receptor	**Monitoring program description including question and/or objective**	**Design and methods** (brief description)	**Results** (brief description)	**Status** (planned, underway, completed, with dates)
Physical Environment	Measures to protect the physical environment.	Desk Based study.	Undertake a review of relevant national, regional and local policies affecting the protection and conservation of coastal waters. Identification of features sensitive to changes in coastal processes e.g. bathing beaches, dune systems etc, SAC coastal features. Data screening exercise to assess existing datasets for baseline definition and complete a gap analysis.	Planned
		Survey based measures.	Detailed site specific survey work of the proposed area will need to be undertaken to fill data / information gaps and provide baseline data. Data	Planned

			will be required on the tidal regime, current flows, wave climate, meteorology, temperature, salinity and suspended sediment concentrations (See Section 4.3 Water Quality and Suspended Sediments).	
Fish and Shellfish	Measures to protect shellfish and fish stocks.	Desk Based Study.	Undertake a review of the relevant national, regional and local policies concerned with the protection and conservation of marine fish and any relevant designations. An assessment of key salmon spawning rivers and their migration routes including a review of migration times and catch data.	Planned
		Survey based measures.	It is anticipated that fish survey work would not usefully add to the understanding of this site in terms of fish ecology, however further consultation with NIEA and DARD would be required on this issue to determine the requirement for bean-trawl surveys and a specific elasmobranches monitoring programme.	Planned
Terrestrial Ecology	Measures to protect Terrestrial ecology.	Desk based study.	A desk-based study will be undertaken to gather all available information on terrestrial habitats and the corresponding flora and fauna found at the Torr Head site.	Planned
		Site surveys	The assessment will include a Phase I Habitat survey which will be carried out in accordance with Joint Nature Conservation Committee (JNCC) guidelines. Based on the outcome of the extended Phase I Habitat survey a Phase 2 habitat survey may be requested involving specialist expertise, for example a Badger survey.	Planned
Large Vertebrates	Future analysis for the protection of large mammals.	Desk based study.	Collate all existing data on marine mammal, seal and turtle usage of the area including details on species, sightings, known routes, haul out sites, pupping areas, feeding grounds and population size. This will also include details on species-specific	Planned

			acoustic sensitivities.	
		Survey Work.	Monthly visual surveys over a period of 12 months are envisaged for marine mammals and turtles to elucidate habitat use and seasonal trends in the area. Consultation will confirm survey scope details.	Planned
Birds	Future analysis for the protection of bird species.	Baseline studies and assessments.	The assessment shall be undertaken by a suitably qualified ornithological consultant specialising in marine birds and in line with appropriate guidance. The assessment will take into account, due to the proximity of the Rathlin Island SPA, the impacts of the development on SPA species. Collision risk analysis may also be relevant depending upon the turbine device chosen, and this will be undertaken if necessary.	Planned
Benthic	Potential impact to Benthic and inner tidal ecology.	Desk based study.	Undertake a review of the relevant national, regional and local policies concerned with the protection and conservation of benthic and inter-tidal habitats and any relevant designations.	Planned
		Survey Work.	Informed by the geophysical surveys, benthic surveys will also entail grab sampling where soft sediments exist for subsequent macro-faunal and sediment analysis. Where a hard substrate or sensitive habitat may exist, a remote or drop down camera will be used.	Planned
Large Vertebrates	Future analysis for the protection of large mammals.	Desk based study.	Collate all existing data on marine mammal, seal and turtle usage of the area including details on species, sightings, known routes, haul out sites, pupping areas, feeding grounds and population size. This will also include details on species-specific acoustic sensitivities.	Planned
Reports or Papers	• THETIS Energy Ltd. (2009). Proposed Torr Head Tidal Scheme. Environmental Scoping Report.			
Research Projects	N/A			