ENVIRONMENTAL EFFECTS METADATA SURVEY FORM

Name of person updating the form	Date submitted
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Project name: Yell Sound

☐ Planned ☐ In Operation ☒Completed

Project description:

Project Developer: The Engineering Business

Technology Developer: The Engineering Business

Technology type: Hydroplane Wing

Resource (wave, tidal): Tidal

Project scale (test site, prototype, array, commercial): Single device

Installed capacity (MW): 150 kW

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

Launch Date: September 2002

Additional Description: The Stingray tidal generator is a tidal stream turbine developed by The Engineering Business, a Newcastle based firm. Stingray uses the flow of the tidal stream over a hydroplane to create an oscillating motion that operates hydraulic cylinders to drive a motor that, in turn, drives an electrical generator. This device is a seabed-mounted machine, to be situated typically in any water depth up to 100m. It weighs some 180 tonnes and is capable of generating 150kw. The system was tested at Yell Sound off Shetland.

Location:

Ocean/Water body: Yell Sound, Shetlands

Closest city:

Country: Scotland

Depth:

Coordinates: 60.5694°, -1.26°

Process status: The programme started in 1997 with the Active Water Column Generator (AWCG), which subsequently developed into the Stingray concept. A technical and commercial feasibility study (Phase 1) in 2001 led to Phase 2 – the design, build, installation and operation of the Stingray demonstrator in Yell Sound in 2002. Phase 2 was extended into 2003 to consider various aspects of the technology in more detail.

Licensing information (brief description): For a commercial tidal stream development in Scotland, consents could be required under: The Electricity Act 1989 and Electricity Works (EIA) (Scotland) Regulations 2000– administered by the Energy Division of the Scottish Executive. However, this only applies to developments exceeding 1MW (s36) or involving overhead cables (s37) and does not, therefore, apply to the Yell Sound site. The Food and Environmental Protection Act 1985 - Part II - Deposits in the Sea (FEPA) – administered by Fisheries Research Services (FRS) division of the Scottish Executive Environment and Rural Affairs Department (SEERAD). Section 34 of the Coast Protection Act 1949 (a CPA consent) - s.34 of the CPA applies to areas below high water mark of ordinary spring tides (HWMOST), which are not excluded from the definitions of sea and seashore detailed in Schedule 4 to the Act. In the case of Yell Sound, the development would not fall within the excluded area, so a CPA consent would be required.

In the case of the Yell Sound site, a works licence was also required from Shetland Islands Council, which has control over development in the coastal area around Shetland and is the harbour authority for the water around Sullom Voe. Although the offshore installation of the Stingray generator does not fall within the control of the normal land-based planning system, there was the possibility of associated land-based activities during the construction phase which required planning permission from Shetland Islands Council. A seabed lease for the Stingray generator and cable route was also required from the Crown Estate.

Key Environmental issues: Part of Yell Sound is a Special Area of Conservation (SAC), due to high numbers of Otters; Seal populations at Yell Sound around 2% of the total population in the UK. The low-lying peaty coastlines provide easy access to fresh water, extensive algal beds in the marine environment and large numbers of otter holts. There are Horse mussel (*Modiolus modiolus*) beds both within Sullom Voe and on the Mainland coast near Colla Firth. Ceteceans are regularly sited in the inner sound, especially Harbour Porpoise, Minke Whale and Killer Whale and there are a wide variety of breeding seabirds, divers and ducks including Eider.

Environmental webpage: http://www.engb.com/hse_environment.php

Baseline studies and project effects studies: Yell Sound				
General description				
Receptor	**Study description including question and/or objective** (several can be listed per receptor)	**Design and methods** (brief description)	**Results** (brief description)	**Status** (planned, underway, completed, with dates)
Physical Environment	Construction effects on sedimentation.	Based on Scoping reports and	Only localised disturbance due to placement of Stingray, effects minimal due to high energy environment.	Completed

		consultee responses.		
Benthos	**Construction** effects on sublittoral (seabed) benthos	Based on Scoping reports and consultee responses	Loss of benthic community due to footprint of gravity base but area of habitat removed insignificant. Area relatively species poor due to high tide energy, and no species of conservation concern will be lost. Effects reversible once Stingray removed. Recovery expected within few months.	Completed
			Exact location of cable unknown. Potential for loss or damage to littoral benthic community due to placement of cable, depending on location. However, no species of conservation concern will be lost. Effects reversible once Stingray removed. Recovery expected within few months.	Completed
	Effects on sublittoral (seabed) benthos **during operation**		Possible further loss of benthic community due to maintenance works requiring lifting and repositioning of unit. However, area of habitat removed insignificant and no species of conservation concern will be lost. Effects reversible once Stingray removed. Recovery expected within few months.	Completed
Large Vertebrates	**Construction** effects on Otter species.	Based on Scoping reports and consultee responses.	Potential for disturbance of otter holts in littoral zone of Yell, and potential disturbance to foraging otters during installation of cable. Survey should take place prior to installation to avoid impacts occurring.	Completed
	Effects on protected species - otter – **During Operation**.		Potential disturbance to otters if maintenance activities require repositioning of cable. Survey prior to installation should identify any holts in the vicinity and positioning will take this into account.	Completed
Birds	**Construction** effects on breeding seabirds.	Based on Scoping reports and consultee responses.	Coast of Yell contains many breeding seabird colonies. Potential for disturbance is reduced due to distance of unit and barge offshore. No large colonies recorded in area therefore probability of disturbance during shore installation works is low. However, nests and young are protected and therefore checks should take place prior to installation to avoid impacts occurring.	Completed

	Effects on diving seabirds – **During operation**.		Depth of unit will be below diving depth of most birds. Potential risk to some deep diving specie such as gannet, but given size of Stingray not considered to be significant issue.	Completed
Marine Mammals	Noise effects on marine mammals.	Based on Scoping reports and consultee responses.	Studies have shown that mammals will avoid areas of excessive noise, and become habituated to constant regular noise. Barge generator noise reduced through use of acoustic hoods.	Completed
	Effects on species of conservation concern - common seal – During operation.		Potential to disturb pupping common seal if present on Yell shore during maintenance works in September if requiring shore works to cable. Checks should take place prior to installation.	Completed
Reports or Papers	• DTI. (2005). Stingray Tidal Steam Energy Device. *Phase 3*.			
Research Projects	N/A			

Monitoring and adaptive management: Yell Sound				
General description				
Receptor	**Monitoring program description including question and/or objective** (several can be listed per receptor)	**Design and methods** (brief description)	**Results** (brief description)	**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	(Key papers on the areas addressed should be listed here; when possible the files themselves can be made available in downloadable PDF format, alternatively links to the files or project website can be provided when available e.g. SeaGen.)			
Research Projects	(past or on-going environmental research projects at the site)			