

Hurricane Energy PLC

Lancaster Field Early Production System Environmental Statement Summary

To: Jonathan Ward

From: Nicola Abrams

Date: 25 August 2017

ES Title:	Lancaster Field Early Production System (EPS)
Operator:	Hurricane Energy PLC (Hurricane)
Consultants:	Aurelia Environmental Ltd
Field Group:	Aberdeen (West of Shetland)
ES Report No:	D/4196/2017
ES Date:	7 March 2017
Block No:	205/21a
Development Type:	Field Development

Project Description

Hurricane Energy PLC (Hurricane) proposes to evaluate the long term productivity of the Lancaster field basement reservoir using an Early Production System (EPS). The Lancaster field is located in Block 205/21a, approximately 95 kilometres (km) west of the Shetland Islands and 50 km from the UK/Faroes median line.

The EPS will involve the intervention and completion of wells 205/21a-6 and 205/21a-7Z, which were drilled in 2014 and 2016 respectively, using an anchored semi-submersible drilling rig. The subsea wells, which are approximately 25 metres (m) apart, will be fitted with electro-submersible pumps to aid production, and with xmas trees with integrated protective structures. The wells will be connected to a floating production, storage and offloading (FPSO) vessel, the refurbished *Aoka Mizu*, via a production manifold and two separate 2.1 km flexible production flowlines. Produced oil will be exported via shuttle tankers, and produced gas will be used as fuel with excess gas flared. The EPS forms the first phase (up to 6 years) of potential development of the Lancaster field, with the objective of confirming that it is feasible to proceed to full field development. Any full field development would be the subject of a further Environmental Statement (ES).

It is anticipated that the infrastructure within the well safety zone will require to be protected by up to 1,000 grout bags and 85 mattresses; the flowlines will require to be protected by up to 46 mattresses and 44,000 tonnes of rock; and the risers will be protected by up to 293 mattresses. The FPSO will be secured by 12 mooring chains and piles arranged in 3 bundles of 4 chains.

The maximum production rate during the 6-year EPS development phase is anticipated to be 4,770 m³ (30,000 bbls) per day for oil and 395,000 m³ per day for gas. First production is anticipated for Q2 2019, which will be treated using the on-board separator and treatment package with produced water discharged in line with regulatory standards. Gas will be used as fuel (22,181,983 m³ per annum) or flared, as there is no suitable gas export route available. Both produced water reinjection (PWRI) and gas reinjection were considered by Hurricane. However, as the purpose of the EPS is to appraise reservoir performance, these options were discounted due to the potential to damage the reservoir and/or affect reservoir

performance.

Key Environmental Impacts

The ES and supplementary information identified the following key activities as having the potential to cause an environmental impact:

- Seabed disturbance from rig anchors, pipeline installation, protective deposits and FPSO moorings;
- Underwater noise from piling of mooring system;
- Atmospheric emissions from combustion and flaring of gas;
- Discharges of produced water and production chemicals;
- Interactions with other sea users; and
- Oil spill risk

Key Environmental Sensitivities

- Fish: The area is a recognised spawning area for Norway pout, and sandeels and a nursery area for Norway pout, blue whiting, mackerel and sandeels. However, the areas are extensive and any potential impact would be localised and temporary. The proposals are therefore unlikely to have any significant impact on these species.
- Seabirds: Seabird vulnerability varies from low to high during the year. Sufficient mitigation measures are considered to be in place to prevent accidental spills that could have a significant impact on seabirds, including a commitment from Hurricane to secure access to oil spill response resources located on Shetland.
- Protected habitats: No potential Annex I habitats have been identified in the vicinity of the proposed development. The closest designated Annex I habitats are the Wyville Thompson Ridge (120 km) and the Solan Bank Reef (130 km) both located to the southwest of the development. The proposed Seas off Foula Special Protection Areas (SPA) is approximately 30 km to the east of the development location. There are also a variety of protected sites on the western coast of the Shetland Isles, including Hermaness, Saxa Vord and Vallafield SPAs. Taking into account the distance from these sites and the proposed mitigation to prevent an oil spill, the development is not expected to have a significant impact on protected sites.
- Protected species: Harbour porpoise, white-beaked dolphin, Risso's dolphin, bottlenose dolphin, common dolphin and minke whale have been recorded in this general area. Whilst grey and common seals inhabit the coastal waters around the Scottish coast and have occasionally been observed to travel long distances when foraging, both species are unlikely to be present in large numbers in the development area. The mooring system for the FPSO will be piled and the ES includes an assessment of the potential impacts. The ES has concluded that with suitable mitigation in place the proposed piling will not result in a significant impact on protected species.

- Air quality: As there are no gas export options that will be available within the timeframe of the EPS, Hurricane will utilise gas as fuel and dispose of the excess gas by flaring. Hurricane have considered 3 potential flaring scenarios:
 - Scenario 1: Assuming 3,180 m³/day production rate, base case gas oil ratio (GOR) and minimum production downtime of 20 day/year, this would equate to flaring 48,594,975 m³ of gas per annum;
 - Scenario 2: Assuming 4,770 m³/day production rate, base case GOR and minimum production downtime, this would equate to a likely worst case of flaring 84,468,251 m³ of gas per annum;
 - Scenario 3: Assuming 4,770 m³/day production rate, maximum GOR and zero production downtime, this would equate to an absolute worst case of flaring 122,676,532 m³ per annum.

The flaring for all 3 production scenarios exceeds the highest annual quantity of gas flared for an individual field in the UKCS during 2015. However Scenario 1 would result in a similar level of flaring to that currently undertaken for the Chestnut field which flared just under 71,000,000 m³ during its first full year of production in 2009 and since then has flared approximately 40 - 45 million m³ of gas per year. Scenario 3, the absolute worst case, would equate to approximately 3% of total offshore emissions from the UKCS. Hurricane has committed to full field development only proceeding if a gas export route is available. Taking into account the remote location west of Shetland and the limited timescale for flaring operations (up to 6 years) the ES has concluded that the EPS project will not result in a significant impact on air quality.

- Other users of the sea: The EPS is located within ICES rectangle 49E6, and relative fishing effort in the area is moderate with low to moderate landing values. Shipping density in the vicinity of the proposed development is also moderate. Appropriate navigational controls will be applied and it is not anticipated that there will be any significant navigational risk. There are no renewables or aggregate extraction areas in the vicinity of the development.
- Cumulative impacts: No significant cumulative or in-combination impacts are anticipated.
- Transboundary effects: Sound related to the piling operations will impact Faroese waters, however no significant adverse transboundary effects are anticipated.

Consultation

The Joint Nature Conservation Committee (JNCC), Marine Scotland (MS), the Maritime and Coastguard Agency (MCA), the Ministry of Defence (MoD) and the Northern Lighthouse Board (NLB) were consulted on the proposals. The ES was also subject to public notice.

The following comments were received:

JNCC: JNCC confirmed that they had no objections but requested that a condition be included in any grant of consent requiring a marine mammal mitigation plan to be agreed with JNCC prior to the commencement of piling operations.

MS: MS requested clarifications relating to pipeline protection and decommissioning aspects. Following the provision of additional information, MS confirmed that they had no objections.

MCA: MCA confirmed that they had no objections.

MoD: MoD confirmed that they had no objections.

NLB: NLB confirmed that they had no objections.

No comments were received in response to the public notice.

Conclusion(s)

Following consultation and the provision of the additional information received on 26 June 2017 and 27 July 2017 in response to comments provided by the BEIS Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) and the consultees, OPRED is satisfied that the project is unlikely to have a significant impact on the receiving environment, or on any protected sites or species or other users of the sea.

Recommendation(s)

On the basis of the information presented within the ES, and the additional information provided by the applicant, BEIS OPRED is content to agree to the Oil and Gas Authority (OGA) issuing any necessary consent for the proposals, subject to the following conditions being attached to any grant of consent.

- Prior to the commencement of piling operations Hurricane shall submit a marine mammal mitigation plan to BEIS OPRED, which must be agreed by OPRED in consultation with JNCC.
- Three years after commencement of production operations at Lancaster, Hurricane shall provide BEIS OPRED with a summary report of the outcome of the initial trial period, and shall confirm whether Hurricane plans to continue to full field development. The report shall be submitted to BEIS OPRED within 3 months of completion of the three year period. If Hurricane intends to proceed to full field development, the report should also contain a timetable for the development of the necessary Field Development Plan and accompanying Environmental Statement. If Hurricane does not intend to proceed to full field development, the report should contain a timetable for the development of the draft Decommissioning Programme for the field.
- The EPS approval should be limited to 6 years, with a requirement to submit an amended plan if they wished to extend the proposals.

.....*Jonathan Ward*..

25/08/2017.....

Jonathan Ward
Director, Offshore Environment Unit
BEIS OPRED

Date