

PREMIER OIL UK LIMITED
CATCHER, VARADERO & BURGMAN FIELD DEVELOPMENT
ENVIRONMENTAL STATEMENT SUMMARY

To: Sarah Pritchard - Head of Offshore Environmental Operations

From: Tracy Edwards - Environmental Manager

Date: 4 June 2014

ES Title:	Catcher, Varadero and Burgman Field Developments
Operator:	Premier Oil UK Limited
Consultants:	N/A
Field Group (DECC):	Central North Sea – Field Team Leader Mark Simpson
ES Report No:	D/4158/2013
ES Date:	29 th NOVEMBER 2013
Block Nos:	28/9A & 28/10
Development Type:	Oil & Gas Field

Project Description

The development comprises three fields, Catcher, Varadero and Burgman, which lie approximately 200 kilometres (km) east of Aberdeen in water depths ranging from 84-127 metres (m). Each field will be exploited by a subsea development tied back, via individual 38" bundles, to a centralised FPSO located approximately 4 km from the individual fields. The FPSO oil storage capacity will be approximately 750,000 barrels (bbl), and oil will be exported fortnightly using a shuttle tanker. Gas will be exported via a new 62 km trenched and buried pipeline connecting to the Fulmar Gas Line, which will be used for gas import during later field life. Seawater injection and gas lift will be required to enhance production. Produced water re-injection will commence when water break-through occurs. Rock dumping will be required to support and protect pipeline crossings, and may be required for contingency stabilisation on the export gas line. Concrete mattresses and grout bags will also be required for protection of subsea infrastructure. A total of 23 wells are planned, a combination of up to 15 producers and up to 10 water injection wells, with first oil planned for Q3 2017.

Key Environmental Sensitivities

The EIA process identified the following environmental sensitivities:

- There are fish spawning grounds in the area for cod, whiting, Norway pout, lemon sole mackerel and sprat; and nursery areas for cod, whiting, haddock, ling, hake, Norway pout, blue whiting, monkfish, plaice, lemon sole, thornback and spotted rays, sprat, sandeels and herring.
- There is high seabird vulnerability in June and November, with moderate to low seabird vulnerability during the rest of the year.
- Cetacean numbers are low for the area, but there are records of harbour porpoises, minke whales, and white-sided and white-beaked dolphins in the area.
- The nearest potential Annex I habitat, a methane derived authigenic carbonate (MDAC) structure, was recorded over 4 km from the Varadero drill centre, but there are no designated sites or areas of search in the development area.
- There is moderate shipping density in the development area.

- Fishing effort is low to moderate throughout the year, for demersal, pelagic and shellfish species.
- An archaeological assessment identified one previously unknown wreck located 1.8 km to the southeast of the FPSO and approximately 400 m southwest of the gas export pipeline route. It is considered that this may be a World War 1 wreck. A second previously unknown potential wreck was identified located nearly 3 km to the west of the Burgman drill centre. It is considered that this could be of medieval origin.

Key Potential Environmental Impacts

Potential impacts on the environment were documented in the ES and the additional information provided.

Drilling Operations

- Drilling will take place continuously over a period from Q3 2015 to Q2 to 2019.
- The placement of the spud cans, anchors and anchor chains will disturb localised areas of seabed. The total disturbance relating to all the drilling activities is estimated to be 42,981m², but impacts will be of comparatively short duration and recovery is likely to take place during the drilling programme through immigration into the disturbed area. Remedial action will be undertaken, as necessary, if any anchor mounds are identified.
- The discharge of cuttings and Water Based Mud (WBM) has been modelled, and it is predicted that impacts on benthic fauna will be restricted to within 100 m of each drill centre, with recovery within 3 years. Potential impacts at the wreck locations would be restricted to deposits of only 0.01 mm, which is deemed negligible. Cuttings contaminated with Low Toxicity Oil Based Muds (LTOBM) will be skipped and shipped to shore for treatment and/or disposal
- The permanent structures within the three drill centres will comprise 23 wellheads and 6 drilling templates, impacting a total of approximately 1,000 m² of seabed. The extent of this disturbance is deemed minor in the context of the overall development.
- A 500 m safety exclusion zone will be imposed for each drill centre and the FPSO. This will reduce the risk to fishing vessels and other sea users, and the exclusions are considered to be insignificant in terms of loss of access.
- Atmospheric emissions of CO₂ from the drilling activities will equate to approximately 1.23% of total UKCS annual emissions. This is not considered significant, considering the scale and duration of the operations.

Infrastructure Installation Operations

- The FPSO will be maintained in place using 12 piled anchors in a 3-way spread. The total area disturbed by FPSO activities during the life of field is determined as 86,68m². Given the extent of impact and the widespread nature of local habitats, this area of disturbance and the 500 m safety exclusion zone are not considered to be significant impacts.
- Infield pipelines will be bundled in a 38" carrier pipe laid on the seabed with manifolds and riser bases at the ends of each of the three lines. Rigid spools up to 100m in length will connect from the manifolds to each well. The total seabed area impacted during the installation operations will be approximately 43,200 m², and the total area impacted by the installed infrastructure, including areas protected by concrete mattresses and grout bags, will be approximately 11,186 m². These areas are not considered to be significant, and there will be no impact on the wreck locations. Fishing-friendly towheads will be used and the 38" lines will be designed withstand the impact of fishing gear. Fisheries interaction risks are therefore considered to be negligible.
- The gas export pipeline line will be trenched and backfilled using a plough system. A total of 26,000 tonnes of rock will be required for three pipeline crossings, plus a contingency

of 17,000 tonnes to supplement the trenching if adequate depth and backfill are not achieved. The total potential area of impact is estimated to be 1,302,000 m². However, benthos and sediments are expected to recover rapidly, given the reinstatement of the seabed over the pipeline and the potential for recolonisation from adjacent areas. A permanent change to a hard substrate will result from the rock deposits, potentially impacting up to 43,000 m² but this is not considered significant.

- Exclusion zones will be established around the wreck locations, to prevent any impact relating to the installation activities.
- Potential impacts from noise were assessed for drilling, vessel movements and the piling of the drill templates, the manifolds and FPSO mooring system. The worst case assessment suggests that there is the potential for injury to cetaceans within 50 m of the piling source. However, appropriate mitigation will be in place to ensure that the risk of injury or disturbance is low.
- Atmospheric emissions of CO₂ associated with the installation activities are estimated to be equivalent to 1.6% of emissions from all domestic shipping during 2011. However, given that the installation activities will take place over 21 months, this is not considered to be significant.

Production Operations

- Produced water (PW) will be re-injected, and there is an option to store PW on-board the FPSO during any reinjection down-time. If discharge is necessary, the PW will be treated to achieve a specification target of 10mg/l dispersed oil. Chemical use and discharge will be risk assessed assuming a worst-case reinjection down-time, but routine discharges are not expected, given the reinjection philosophy. Routine sand discharges are also unlikely, unless the down-hole screens fail, and discharges of clean sand from process vessels would not be expected to have any significant impact on the marine environment.
- Potential worst-case oil spills of 149,937 m³ from storage on the FPSO and 433,608 m³ from a Varadero well blow-out have been assessed. Appropriate control mechanisms will be in place to ensure that the risk of such an incident is as low as reasonably practical, and a valid OPEP will be in place before operations commence.
- Atmospheric emissions have been determined on the basis of a worst-case 39 MW power demand during operations, using dual fuel, DLE ready, gas turbine generators and a 95% uptime estimate. Annual emissions of CO₂ are estimated to be approximately 2.3% of total UKCS offshore installation emissions.

Decommissioning Operations

- Field life is estimated to be circa 20 years, and all wells, subsea infrastructure and associated production facilities will be decommissioned in accordance with statutory requirements in force at the time.

Consultation

Comments were sought from Marine Scotland, the Joint Nature Conservation Committee, the Maritime and Coastguard Agency, the Ministry of Defence and the Northern Lighthouse Board. There were no objections to the proposals, but it was requested that standard conditions should be included in subsequent environmental and navigational approvals.

The Environmental Statement was also subject to Public Notice, but no comments were received.

Further Information

A number of clarifications were requested in response to comments received from consultees and

the outcome of the DECC review. Premier subsequently met with the Department, and responses to the request were received on 9th and 29th May 2014. The additional information provided was satisfactory, and there are no outstanding issues.

Conclusions

Following consideration of the Environmental Statement, the comments received from consultees and the requested additional information, DECC is satisfied that this project is not likely to have a significant adverse effect on the receiving environment, including any protected sites or species, or on any other uses of the sea.

Recommendation

On the basis of the information provided, DECC is content to accept the Environmental Statement, and there are objections to the issue of consent for the proposed developments. Our approval is conditional upon the consideration of monitoring to validate the predictive modelling relating to potential impacts on the identified wreck.

.....*Sarah Pritchard*.....

Sarah Pritchard

.....05/06/2014.....

Date