Offshore Petroleum Regulator
for Environment & Decommissioning

Chevron North Sea Limited
Rosebank Field Development

Environmental Statement Summary

To: Jonathan Ward
From: Angela Flowers
Date: 14/12/2018

ES Title: Rosebank Project
Developer: Chevron North Sea Limited
Consultants: Xodus Group Limited
OGA Field Group: West of Shetland
ES Report No: D/4218/2018
ES Submission Date: 17th July 2018
Block No: 213/27 and 205/2
Development Type: Field Development

Project Description

Chevron North Sea Limited (Chevron) propose to develop the Rosebank oil and gas field. The field is located in Blocks 213/27 and 205/2 in the west of Shetland area, approximately 130 kilometres (km) from the UK coastline and 15 km from the UK / Faroes median line. The field is located in the Faroe-Shetland Channel, in a water depth of approximately 1,100 metres (m).

Chevron plan to develop the field using a permanently moored Floating Production, Storage and Offloading (FPSO) installation, connected to the shore via a third party owned subsea fibre-optic communications cable. There will be up to nine production and eight water injection wells, tied back via flexible flowlines and chemical injection and control umbilicals to three production manifolds and two water injection manifolds. The manifolds will be installed using suction piles and will be tied back via flexible flowlines and umbilicals to the FPSO. Oil will be separated and stored on the FPSO for offtake via shuttle tankers. Gas will be separated on the FPSO and either used for fuel or gas lift or exported via a proposed new export pipeline system. Produced water will be reinjected into the reservoir and produced sand will be treated prior to discharge. If the produced water injection system is offline, produced water that meets the required regulatory standard will be discharged. If it doesn’t meet the required standard and cannot be stored on the FPSO, production will be suspended.

The new export pipeline system will consist of a surface-laid 236 km pipeline routed to the south of the Shetland Isles to tie-in to the Shetland Island Regional Gas Export (SIRGE) pipeline system that links the Shetland Gas Plant to St Fergus via the Frigg pipeline. Approximately 124,000 tonnes of rock and 53 tonnes of concrete mattresses are proposed for pipeline protection and pipeline and cable crossings. The pipeline system has the capacity to accommodate future subsea tie-ins or to import gas when the FPSO becomes gas deficient.
Pipelay is scheduled for Q1 2022 and drilling the first wells and installing the first manifolds is scheduled for Q2 2022. First oil is scheduled for Q4 2024, with final well completion in 2027. Peak oil production is estimated to be approximately 13,300 tonnes/day in 2025 and peak gas production is estimated to be approximately 2,380,500 m³/day in 2031.

Key Environmental Impacts

The Environmental Statement (ES) identified and discussed the following operations as having the potential to cause an environmental impact:

- Drilling operations - marine discharges including water-based mud and cuttings, thermo-mechanically treated oil-based cuttings and residual cement; atmospheric emissions; and noise from vessel and drilling rig operations, including vertical seismic profiling of the wells.
- Infrastructure installation operations - subsea infrastructure footprint including wells, manifolds, flexible flowlines, umbilical's, FPSO including risers and moorings, the gas export pipeline and protective deposits; noise from installation vessels and suction piling of manifolds and moorings; vessel presence and combustion emissions; and marine discharges associated with flowline commissioning.
- Production operations - marine discharges when the produced water re-injection system is not available, atmospheric emissions from power generation, intermittent flaring and venting and fugitive emissions.
- In combination, cumulative and transboundary impacts.
- Accidental events.

Key Environmental Sensitivities

The ES identified the following key environmental sensitivities:

- Fish: In the shallower continental slope areas adjacent to the development there are spawning grounds for anglerfish, blue whiting, cod, haddock, lemon sole, Norway pout, whiting, herring, sandeels and sprat, and there are nursery grounds for anglerfish, blue whiting, cod, European hake, haddock, hake, lemon sole, ling, Norway pout, saithe, whiting, herring, horse mackerel, mackerel, sandeels, sprat, common skate, spotted ray and spurdog. Important non-commercial species found in the deeper water area include basking shark, velvet bellied shark and blackmouth dogfish. However, the spawning and nursery grounds for most species are extensive and pipelay will be timed to avoid peak herring and sandeel spawning periods. The proposals are therefore unlikely to have any significant impact.
- Seabirds: The Faroe Islands, Shetland Isles and Orkney Isles and surrounding waters are internationally important for birds with RAMSAR sites and Special Protection Areas designated for breeding seabirds, over-wintering birds and migratory birds. The proposed export pipeline is located within the Seas of Foula pSPA and a Habitats Regulations Assessment will be required to determine likely significant effects on qualifying species and the integrity of relevant sites. An Oil Pollution Emergency Plans will be required for the drilling, infrastructure installation and production operations.
- Marine mammals: Of the 27 species of cetaceans recorded in UK waters, 23 are present in the deeper waters west of Shetland. The most frequently sighted are the harbour porpoise, Atlantic white-sided dolphin and the blue, fin, minke, humpback, sperm, bottlenose long-finned pilot and killer whales. Grey, harbour and hooded seals are also infrequently sighted in these waters. However, operations are considered unlikely to result in any significant impact on marine mammals.
• Other protected habitats / species: Deep sea sponge aggregations centred on the continental slope area around the 500 m depth contour are a Priority Marine Feature (PMF) and the area is a designated Marine Protected Area to protect the sponge aggregations and other qualifying features. Ocean quahog, another PMF, is a qualifying feature of the Faroe-Shetland Sponge Belt MPA and also found in the shelf areas. Cold water coral, also a PMF, is known to occur on the upper continental slope and shelf but none was noted in the vicinity of the proposed development. It is considered unlikely that the limited footprint of the pipeline would adversely impact these features.

• Other users of the sea: Shipping in the area includes vessels serving west of Shetland oil and gas installations and the Sullom Voe facilities, as well as ferries serving the Faroe Islands. In general, shipping levels increase on the continental shelf, particularly to the east of Shetland, and includes both commercial and ferry traffic. Fishing activity is limited in the deeper waters in ICES rectangles 50E6 and 51E6, but two thirds of the gas pipeline is located on the continental shelf in ICES rectangles 49E7, 48E8, 48E9, 49E8 and 50E7 where effort, landings and value are much higher. Effort also increases close to the shore as over 76% of the Shetland fleet are inshore vessels less than 10 m in length, fishing for scallops, crabs, langoustine and lobster. Farmed salmon and cultivated mussels are also important in coastal areas. The shelf area is an MoD training area, and the pipeline crosses the FARICE telecommunications cable and a number of oil and gas pipelines and fibre optic cables. Safety zones and appropriate navigational controls will be in place, and it is not anticipated that there will be any significant impact on other users of the sea.

• In combination, cumulative and transboundary impacts: No significant in-combination, cumulative or transboundary effects are anticipated.

**Key Mitigation Measures (including environmental or monitoring conditions)**

• A geotechnical survey will be undertaken to finalise the pipelay route, to avoid any sponge aggregations and rocky reef where practicable and to minimise the rock and concrete mattress deposit requirements. A detailed pipeline application will be submitted to cover the pipelay activities, including an assessment of noise and physical presence impacts upon qualifying species of European protected sites including breeding and migrating birds and seals, other European Protected Species and the basking shark. Pipelay will also be timed to avoid the peak herring and sandeel spawning periods.

• Fishing-friendly subsea infrastructure will be installed with regular pipeline surveys and other controls to minimise fishing interaction. There will be a 500 m exclusion zone around the FPSO, five manifolds and the remote wells, and appropriate navigational risk assessments will be undertaken for all drilling and infrastructure installation operations.

• Operational discharges from the FPSO will be minimal as produced water will normally be re-injected into the reservoir. Drilling and pipeline commissioning chemicals will be subject to standard regulatory limits and controls.

• Combustion equipment has been optimised for energy efficiency with the selection of power generation units that are dry low-NOx ready, the installation of waste heat recovery units on all power generators, the use of electrical power for equipment such as cranes and the use of low sulphur conditioned gas as the primary fuel with diesel only used if gas is not available.

• Flaring will be minimised by flare gas recovery and a system designed to mitigate pilot blow-out, with flaring only envisaged during start up, process upset, emergency shut down and for safety reasons during maintenance activities.

• The FPSO will be equipped with a hydrocarbon gas recovery unit to avoid continual venting during operations, and a Volatile Organic Compounds Management Plan will
be prepared to include shuttle tanker fugitive emissions.
- The Joint Nature Conservation Committee (JNCC) guidelines for minimising the risk of injury to marine mammals from geophysical surveys will be implemented for the vertical seismic profiling and sub-bottom profiling operations. (Suction piling has been selected to install the manifolds and moorings to minimise noise).
- A commitments register detailing agreed with key mitigations will be tracked by the operator.

Consultation

The Joint Nature Conservation Committee (JNCC), Marine Scotland (MS), Scottish Natural Heritage (SNH), the Maritime and Coastguard Agency (MCA), the Northern Lighthouse Board (NLB), the Ministry of Defence (MoD), Shetland Islands Council, the Faroe Islands Geological Survey and the Scottish Environment Protection Agency (SEPA) were consulted on the proposals and the ES was also subject to public notice. The Health and Safety Executive (HSE) was also notified of the ES.

- JNCC and SNH confirmed that they would wish to see the report of the pipeline pre-lay survey to review the location of the pipeline relative to deep sea sponge aggregations and rocky reef, and that the relevant application for the pipelay operations should assess the impacts upon qualifying species of European protected sites, European Protected Species and the basking shark. A Habitats Regulations Assessment would also be required to assess the impacts upon the European protected sites.
- MS confirmed there were no objections subject to the imposition of appropriate regulatory conditions.
- MCA confirmed there were no objections subject to the imposition of appropriate navigational conditions.
- NLB confirmed there were no objections, subject to the imposition of the standard navigational consent conditions.
- MOD confirmed there were no objections.
- SEPA confirmed there were no objections.

There was no response to the public notice.

Further Information

Additional information was requested from Chevron to address issues raised by consultees and during the internal BEIS OPRED review. The requested information included:

- Clarification of FPSO anchoring proposals (confirmed to be suction piling).
- Information relating to the use of transponders for FPSO location, and the modelling of all noise sources.
- Additional details of the produced water and treated seawater systems, including design criteria and capacity noting the potential for future development tie-ins.
- Additional information in relation to process and intervention chemical use and discharge.
- Pipeline route information, showing depth, crossing points, potential Annex I reef habitat and protective deposit requirements.
- Detailed assessment of the impact of the gas pipeline on the Seas of Foula pSPA.
- Further information in relation to potential fisheries interactions, including details if fishing-friendly infrastructure.
- Information relating to the tie-in to the SIRGE pipeline.
- A detailed vessel activity plan for pipelay proposals over the two summer installation
seasons.
- Future pipeline monitoring proposals to address the possibility of free-spans. (It was agreed that all the additional issues relating to the proposed pipeline system will be a requirement of the pipelay application).
- An assessment of likely significant effects on all qualifying features of the Faroe-Shetland Sponge Belt MPA, including any cumulative impacts.
- Further information in relation to oil spill modelling to determine potential impact on the Faroe Island RAMSAR sites. (This will be incorporated into the oil spill response strategy).

Additional information was provided by Chevron on 1st, 14th and 22nd November 2018 which adequately addressed the issues raised.

The installation of the fibre optic cable connecting the FPSO to onshore will be the responsibility of the third party cable owner and was not addressed in the ES. A separate application for a marine licence will be submitted in due course.

**Determination**

Following the review of the ES, the responses received from consultees and the additional information provided by Chevron, BEIS OPRED is content that the proposed development will not have a significant adverse impact on the receiving environment or the living resources it supports, or on any protected habitats or species or other users of the sea.

**Recommendation**

On the basis of the information presented within the ES, the advice received from consultees and the further information by Chevron, BEIS OPRED is content that there are no objections to the proposals, and agrees to the OGA issuing consent for the proposals. BEIS OPRED is also content that there are no specific mitigation or environmental conditions directly related to the proposals that need to be attached to the OGA consent.

Jonathan Ward  
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BEIS OPRED