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## Consents given under the Petroleum Act 1998 and Reviews under the Assessment of Environmental Effects Regulations 1999

Shell UK

### SKIFF FIELD

Pursuant to Regulation 5(8) of the above Regulations, the Secretary of State for Trade and Industry gives notice that, being content that the requirements of the above Regulations have been satisfied, he has, pursuant to Licences P8, granted a consent to Shell Exploration Production Company (U.K) Limited to the getting of petroleum and the construction of installations in relation to the development of the Skiff field. The consent for the Skiff field took effect from 08/02/00 and shall last until 17/09/10.

#### Background

The Skiff field is located in Block 48/20a of the Greater Sole Pit area of the southern North Sea, approximately 72km north / northeast of the Norfolk coast. Shell intend drilling 4 wells (with a possibility of two more later) from a new NUI. The NUI will be connected via a new pipeline to the existing Clipper platform, which provides processing, and export facility for the Skiff fluids of gas, condensate and water.

#### Drilling

The drilling rig has not been selected, however it will be a cantilever type jack-up rig. The base case is to drill 4 wells (with a possibility of two more later) from a new NUI. Three of the wells are to have dual laterals, or horizontal sections, allowing for a single well to access two parts of the reservoir. All well sections are to drilled with water-based mud (WBM) with subsequent separation of mud and cuttings and overboard discharge of cuttings. The use of oil-based mud (OBM) as a contingency on downhole sections is allowed for in the statement with subsequent zero discharge and skip and ship to shore. Wells will be drilled using conventional drilling techniques for the top-hole sections and the under balanced drilling technique (UBD) for reservoir sections.

The cuttings estimates from the 4 wells (3 dual and 1 single lateral completion) is approximately 12,250 tonnes including a 20% allowance for geological and hole problems. Further information was requested regarding the chemical usage as the OCNS tonnage triggers will be exceeded for Category C and E. Shell have replied stating that they hope to replace one of the Category C chemicals with Category E and that in the event of OCNS tonnage being exceeded they intend to discuss the risk with the regulatory bodies.

#### Well Testing

UBD results in formation fluids being returned to the surface along with mud and cuttings. After separation of formation fluids from the mud and cuttings the fluids are disposed of by flaring. Approximately 21,360 tonnes of gas will be flared over 70 days (10 days of flaring from each lateral). The emission gases (tonnes) from the flaring associated with UBD are shown below.

CO <sub>2</sub>	CO	NO <sub>x</sub>	SO <sub>x</sub>	CH <sub>4</sub>	VOC
59,800	185	32	0.3	384	42

Design features to mitigate flaring effects are discussed including the separation package, which is designed to ensure high efficiency removal of all liquids from the gas phase and continuous monitoring (24 hours a day).

#### Production Issues

Wells are controlled remotely from Bacton, with pressure reduction by means of atmospheric gas release. All well fluids are to be exported to Clipper for processing. Mono ethylene glycol (MEG) for hydrate prevention and corrosion inhibitor is imported from Clipper to Skiff via a 2" line and injected to the Skiff pipe work and export line. Utilities will be very limited on Skiff. Under normal conditions the only utilities required for production and control of the installation are electrical and hydraulic power and MEG/CI injection. Reception facilities dedicated to Skiff production will be located on the Clipper platform. Initially the reservoir pressure will be sufficient to allow transport to Bacton.

In the latter stages of the field life the pressure will become inadequate with the use of the existing compression facilities onboard Clipper required.

### **Pipeline Issues**

Two new interfield pipelines are required a 12" production export pipeline and 2" MEG / CI line. A 10" header connects the Skiff manifold to a 12" export line. The pipeline integrity monitor alarms will enunciate at both Clipper and Bacton. Both lines will be provided with pipeline mattresses to protect the lines. The lines will not be trenched, however they will have self-burial fins.

### **Decommissioning**

Production from the Skiff field is forecast to continue for 30-40 years at which time the Skiff field will be decommissioned with complete removal of the NUI.

### **Environmental Sensitivities**

#### **Atmospheric emissions.**

During production there will no flaring or routine venting. Flaring will occur during drilling operations. The emissions from this are small when considered in the context of the 4 wells (7 laterals) that are to be drilled by UBD and the mitigative measures.

#### **Cumulative effects**

The Skiff development represents a minor increase in total gas production for the southern North Sea. The environmental effects of the increase in gas production are quoted as minimal, a view with which we concur.

#### **Hydrocarbon spills**

Spills will be restricted to condensate as this is a gas platform, and / or diesel, used for power on the drilling unit. A worst case scenario of a 240 tonnes spill of diesel was modelled. The model results indicate that such a spill size would disperse and be removed from the sea surface within a very short time and distance from the platform and would not impact the nearest shoreline (Norfolk coast). No condensate spill modelling was discussed. However this spill trajectory and time taken to disperse is likely to be similar to the modelled diesel.

#### **EMS**

A management system exists with the Shell Expro Corporate EMS certified to ISO 14001 for EMS. The Gas Supply Group, which will operate Skiff, shares the company wide EMS requirements.

#### **Transboundary Effects**

Skiff is approximately 70 km from UK / Dutch median line. Emissions will occur during drilling and pipeline commissioning including hydrotest fluids, WBM discharge and flaring of gas as a result of UBD. These events are short term. The amount of gas flared from 7 laterals (21,360 tonnes) is approximately 20% of the 1998 total (107,217 tonnes) as reported in the EEMS data. The gaseous emissions from flaring when compared to the 1998 mobile units emissions data from EEMS results in the following percentages of total emissions.

<b>CO<sub>2</sub></b>	<b>CO</b>	<b>NO<sub>x</sub></b>	<b>SO<sub>x</sub></b>	<b>CH<sub>4</sub></b>	<b>VOC</b>
4%	2.3%	0.17%	4 * 10 <sup>-3</sup> %	5.2%	1.2%

During the production phase, Skiff will be virtually zero discharge, with likely discharges to be fugitive emissions, cold vented gas due to maintenance depressurisations and machinery space discharges after treatment. No TBEs have been identified.

#### **Shipping lanes**

The location of the Skiff development was a key issue due to the presence of heavy shipping traffic, sandbanks and relatively dense oil and gas installations in the locality. After consultation with the DETR and DTI the location of the platform was moved off centre from the field.

#### **Pipeline commissioning**

Proven difficult to comment, as pre-commissioning and hydrotest chemicals not specified. Approximately 900 m<sup>3</sup> of hydrotest fluid will be discharged with biocide used at a concentration of 20ppm. Discharge is to occur either at Skiff or Clipper, with overspill discharge from line filling (100 m<sup>3</sup>) to be made at a 20-25 m water depth and the main hydrotest discharge (800 m<sup>3</sup>) to be made at the surface. Shell have offered to provide an update on hydrotest fluids once their plans are more advanced. However the chemicals will be subject to review and consultation when a Pipelines Works Authorisation is requested by Shell.

#### **Recommendation**

Overall, the ES is satisfactory and adequately assesses the potential environmental impacts of the proposed development. Recommend that consent for the development is given.