

**Gaz de France Suez Exploration and Production UK Limited  
Cygnus Field Production Phase 1  
Environmental Statement Summary**

<b>ES Title:</b>	Cygnus Field Development Phase 1
<b>Operator:</b>	Gaz de France Suez E & P Limited (GdF Suez)
<b>Consultants:</b>	Metoc Plc.
<b>Field Group (DECC):</b>	London
<b>ES Report No:</b>	D/4040/2009
<b>ES Date:</b>	March 2009
<b>Block Nos:</b>	44/11a & 44/12a
<b>Development Type:</b>	Gas Field Development

**Project Description**

The proposed development is located in Blocks 44/11a & 44/12a in the Southern North Sea, approximately 159Km north-east of the North Norfolk coastline and approximately 40Km west of the UK/Netherlands median line. The field consists of a dry gas with low condensate-gas ratio. The Cygnus Field lies within the boundaries of the Dogger Bank draft Special Area of Conservation (dSAC), with the dSAC boundary lying 40Km to the east and 22Km to the South of the proposed development.

The project comprises of:

- **Drilling 2 production wells**, installing a single **Normally Unmanned Installation (NUI)** (Cygnus A) and a new **27Km 12” gas export line** with a **3” piggy-backed chemical line**, which will connect into the McAdam subsea template via a pipeline end manifold (PLEM) and connecting spools. Export will then be to the Murdoch Platform and eventually to Theddlethorpe via the existing Caister Murdoch System line. The wells will be drilled using a combination of water based mud (WBM) and low toxicity oil based mud (LTOBM), with WBM discharged to sea and all LTOBM contained and shipped to shore. The export lines will be trenched and mechanically backfilled, using a dynamically positioned vessel.
- **2 Further ‘contingent’ production wells** to be drilled from the NUI.
- **2 appraisal wells** (44/12a-E & 44/12a-F) are planned for 2011 to support potential later development phases and will be well tested for less than 96 hours (80 hours and 36 hours respectively) which will result in approximately 11,612 tonnes of CO<sub>2</sub> being generated from both tests. These wells will be drilled during the second half of 2011 into different fault blocks, with the aim of de-risking further development options.
- It is planned that construction activities will commence in October 2009, with the drilling of the first two gas producing wells. The installation and commissioning of the pipelines is expected to take approximately 30 days and is scheduled for June/July 2010. The platform will be installed over the suspended wells and is programmed for July 2010. It is expected to take between 1 to 2 days to install the Cygnus A NUI. First oil is expected in November 2010, with peak production of 94.63MMscf/d occurring in 2011. Field Life is estimated to be 30 years.
- Rock dumping may be required in the following areas:- Rig stabilization –contingent 3,000 tonnes, stabilization of jack up barge for carrying out fracturing operations – contingent 3,000 tonnes, contingent spot rock dumping to address upheaval buckling 25,000 tonnes. 4,800 tonnes of rock will be used in the crossing of the Tyne to Trent pipeline & approximately 100 mattresses will be used in the pipeline crossing, trench transition areas surrounding the crossing, platform and the pipeline end manifold (PLEM).

## Key Environmental Sensitivities

The EIA identified the following environmental sensitivities:

- Annex 1 Habitats: The majority of the proposed project is within the Dogger Bank dSAC.
- Seabird vulnerability is very high in October, high in September, November, April and May and moderate to low for the remainder of the year.
- Fish spawning area for mackerel, plaice, sprat, sole, sandeels and Norway lobster. Fish nursery for whiting, nephrops and sprat.
- Cetacean abundance is relatively low in the Southern North Sea but the harbour porpoise, Minke Whale and White beaked Dolphin are likely to be present in the project area.
- The proposed development is situated across ICES rectangles 38F2 & 37F2, with demersal species representing the largest % of the total catch. Whilst these areas represent 42% of the average annual commercial value of fishing activity on the Dogger Bank, the cost per unit effort is low indicating a considerable amount of time is spent fishing.
- An area of relatively high shipping density.

## Key Potential Environmental Impacts

Potential impacts and mitigation were discussed in the EIA. The key areas of concern largely related to the direct physical impacts on the dSAC site during drilling, platform and pipeline installation.

### Impacts from Physical Presence of Rig and Rig Stabilisation & Platform Presence

**Rig Placement:**-The placement of spud cans of the jack up rig will disturb localised areas of seabed and it is expected that approximately **0.000414Km<sup>2</sup>** of seabed to a depth of 0.5m will be impacted during the drilling campaign. However drilling of the appraisal wells will take place at 2 different locations i.e. 3 drilling locations in total, therefore the total impact from spud can placement during phase 1 of the project will be **0.001242Km<sup>2</sup>**. The duration of this disturbance will be limited and recolonisation is expected as the benthic assemblages within the vicinity of the rig are characteristic of the wider area. The rig will endeavour to re-position itself in the existing footprint when returning to the site, thereby limiting the potential impact.

**Jack up barge Placement:**- The jack up accommodation barge will be used to support the fracturing process and has four legs each terminating in a spud can similar to the rig. This will result in **0.000522 Km<sup>2</sup>** of the seabed being disturbed. However this will be of limited duration and the barge will endeavour to re-position itself in the existing footprints when returning to site. It is expected any impact will be localized and temporary.

**Rig/Jack up Barge Stabilisation:**- Rock dump to stabilize the rig and jack up barge will also disturb the mobile benthic fauna and smother the fixed flora and fauna. In addition, the local habitat will be changed from mobile sediment to rock, potentially introducing a new habitat and excluding the present local benthos. However it is expected that over time this rock will be covered by sandy sediments and allow recolonisation by the local benthos. Gaz de France Suez have referenced a post drilling sea bed survey at the Cygnus Exploration well which suggested that within three months of rock dump being placed on the seabed it is either dispersed or covered with sand. Rig stabilisation is only a contingency and in the event it is required a localised area will be impacted (**0.001767Km<sup>2</sup>**). It is expected that recolonisation will occur over time.

**Platform Presence:**- The proposed Cygnus A platform location lies on the northern slope of the Dogger Bank in water depths of 20.3 m. The overall footprint of the platform taking into consideration the impact from the platform legs, mud mats associated with the legs,

conductor guides and drilling template is estimated to be **0.0002134Km<sup>2</sup>** (213.4m<sup>2</sup>). The installation of the Cygnus A platform will disturb the sediments and seabed communities directly in the footprint of the platform and although this will be present throughout the field life, the area of impact is localised.

#### **Impacts from the Mud and Cuttings Discharge**

The discharge of water based drill cuttings will impact an estimated area of 11,540m<sup>2</sup> of the seabed. This is a conservative estimate and is based on a worst case scenario of cuttings piles not overlapping either spatially or temporally. In reality the production wells will be drilled consecutively from the same location and therefore the area of impact is likely to be less than predicted. Cuttings will be deposited in an elliptical orientation along the major axis of current flow NW/SE. Information from historic wells has been presented to demonstrate that deposition of cuttings is generally confined to within 500m of the discharge location. The production wells are expected to take up to two months to drill and recovery will commence following cessation of drilling, with cuttings incorporated into surface sediments through bioturbation and general sediment mobility. Any impact is expected to be temporary.

#### **Impacts from the Pipeline Installation and associated Rock Dumping**

Trenching and backfilling of the 27Km 12" pipeline and 3" piggy backed chemical line will impact a maximum worst case area of **0.572180 Km<sup>2</sup>** (572,180m<sup>2</sup>) using a 21m impact corridor and including the impact from the 6 concrete mattresses and approximately 4,800 tonnes of rock dump at the crossing of the Tyne to Trent gas export line **0.00516 Km<sup>2</sup>** (5,160m<sup>2</sup>). A contingency of rock dump of 25,000 tonnes of rock may be required for potential upheaval buckling at two potential locations which may impact an area of **0.0175Km<sup>2</sup>** (17,500 m<sup>2</sup>). This combined impact of the trenching, backfilling and contingency rock dumping equates to 0.0039% of the Dogger Bank dSAC. A dynamically positioned (DP) vessel will be used for pipe laying which will reduce the impact from anchors as the DP vessel will only require the use of one initiation anchor to help position the vessel and pipeline in the target box, which will limit the impact to a maximum of **0.00002 Km<sup>2</sup>** (20 m<sup>2</sup>). There may be some increase in suspended sediment loads due to the thrusters of the DP vessel whilst working in the shallower areas of the pipeline route i.e. the 15Km crossing the Dogger Bank itself. However the increased sediment loads will be transient and concentrations are expected to return to background levels within a few days to a week. The trenching activity will be of very short duration, maximum of eight days and even taking into consideration backfilling and commissioning of the line, will be in the order of 30 days. Only 15Km of the 27Km pipeline is within the dSAC boundary and although the installation of the pipeline will result in disturbance of the seabed and smothering of the fixed flora and fauna, it is expected that recolonisation will occur once the pipeline has been trenched and backfilled, as benthic assemblages within the vicinity of the pipeline are characteristic of the wider area.

#### **Impacts from Atmospheric emissions**

Well testing will be carried out on the appraisal wells only, in order to de-risk future phased development and will result in approximately 11,200 tonnes of CO<sub>2</sub> being emitted. Emissions will also be generated during the production phase of the development with a maximum of 28,000 tonnes of CO<sub>2</sub> discharged in year one, decreasing to an average of 11,200 tonnes per annum. This equates to 2.2% of UK emissions from offshore installations. The Cygnus Development is 160 Km from land and 15.5Km from the nearest fixed installation and therefore the emissions are unlikely to affect any receptors. Dispersion modeling was undertaken for activities associated with the Cygnus exploration well – well testing and exhaust emissions, which demonstrated that concentrations of NO<sub>x</sub> and CO<sub>2</sub> were diluted to <1µg<sup>-3</sup> within 500m of the discharge point. Emissions from the well testing and production are therefore expected to disperse and are not anticipated to have an adverse effect on the structure, function and integrity of the site, although the emissions will contribute to the global warming it was concluded they would not be a significant contributor.

However many of the impacts are expected to be of short duration and once drilling and

installation has been completed, recovery is anticipated. Based on the scale and nature of the impact it is concluded that the presence of the rig and platform & associated contingency stabilization, the drilling operations, the pipeline installation and associated rock dumping will not have an adverse effect on the structure, function and integrity of the site.

**Public Consultation:** No comments were received as a result of the public consultation.

**Consultee(s):** The statutory consultees for this project were JNCC and CEFAS. The following comments were made:

**JNCC:** On the 8 April 2009, JNCC requested additional information with respect to the impact of the proposed activities on the Dogger Bank dSAC and recommended that since the proposed activities will be mostly carried out within the current proposed draft boundary, that DECC test whether there is likely to be a significant effect and if so advised DECC to undertake an Appropriate Assessment. Following the provision of additional information by GdF Suez, JNCC responded on the 21 May 2009 confirming that they are content for DECC to grant approval to the project. On 9 June JNCC confirmed that they concur with the conclusion of the Appropriate Assessment undertaken by DECC, that the Cygnus Field Development Phase 1 will not on its own or in-combination have an adverse effect on the structure, function and integrity of the Dogger Bank dSAC and are content for the Secretary of State to allow this project to proceed.

**CEFAS:** Responded on the 19 March 2009. CEFAS confirmed that mackerel, plaice, sprat and *Nephrops* spawn in the area and that within the block and/or vicinity there are nursery grounds for whiting, sprat and *Nephrops*. CEFAS confirmed there are currently no restrictions on drilling activity in this block during the period suggested. CEFAS also assessed the chemical information provided in the ES and commented that the chemicals are generally PLONOR whilst those that carry sub warnings are mostly limited to zero discharge applications. The chemicals that carry sub warnings are regularly used and CEFAS would expect GDF SUEZ to be able to justify their use on the PON15. CEFAS anticipate receiving more detailed information in a subsequent PON15 application, and will be able to provide a definitive assessment when this is received.

**Further Information:** In addition to the consultee's comments, a number of issues were highlighted by DECC and further information was requested on the following issues:-production profiles, longer term development plans, pipeline footprint, potential for contingency rock dump at jack up barge, backfilling of pipeline, emissions at Murdoch.

**Conclusion(s):**

Following the consultation period and the appropriate assessment exercise undertaken by the Department, DECC and its consultees are satisfied that the proposed Phase 1 of the Cygnus Field Development is not likely to have a significant impact on the receiving environment, including any sites or species protected under the Habitats Regulations.

**Recommendation(s):**

**On the basis of the information presented within the ES and the supplementary**

information provided by Gaz de France Suez and the advice from consultees, it is recommended that approval is granted for the Cygnus Field Development Phase 1.

Signed:- *Sarah Pritchard*

Dated:- 24.06.2009

Sarah Pritchard

Head of Offshore Environmental Operations