



## Boskalis Offshore bv

Rosmolenweg 20  
P.O. Box 43, 3350 AA Papendrecht  
The Netherlands  
Tel: +31 (0)78 - 69 69 011  
Fax: +31 (0)78 - 69 69 571  
E-mail: offshore@boskalis.nl  
Internet: www.boskalis.com

# Balgzand - Bacton Pipeline (BBL)

A gas pipeline from Balgzand (The Netherlands) to Bacton (UK)

Client: N.V. Nederlandse Gasunie, under auspices of BBL Company  
Main Contractor: Saipem UK Ltd.  
Contractor: Boskalis Offshore bv  
Location: Julianadorp, the Netherlands  
Period: March - December 2006

### Boskalis Offshore: skills, resources, experience

Boskalis Offshore brings together the offshore skills, resources and experience of Royal Boskalis Westminster. The group's offshore capabilities include seabed rectification works for pipeline/cable and platform installation, construction of pipeline shore approaches and landfalls, offshore mineral mining, offshore supply and support services and decommissioning services. Boskalis provides clients with tailored, project-specific solutions for above dredge related offshore services, as illustrated by the following project summary.

### Project description

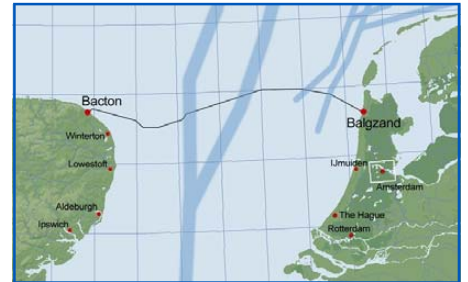
BBL Company was established to design, construct, operate and exploit the Balgzand - Bacton Pipeline (BBL) for the transmission of natural gas from Balgzand, the Netherlands to Bacton in the United Kingdom. The overall length of the 36" offshore pipeline is some 230 kilometres. The capacity is around 42 million cubic metres of gas a day.

As part of the pipeline installation, Saipem UK Ltd awarded Boskalis Offshore the contracts for the shore approaches at Julianadorp, the Netherlands and Bacton in the United Kingdom and the pre-sweeping and rock dumping works along the pipeline route on the North Sea.

Boskalis subcontracted the shore approach at Bacton to the Land & Marine Westminster Joint Venture (comprising Land & Marine Project Engineering Ltd and Boskalis Offshore's sister company Westminster Dredging Co. Ltd).

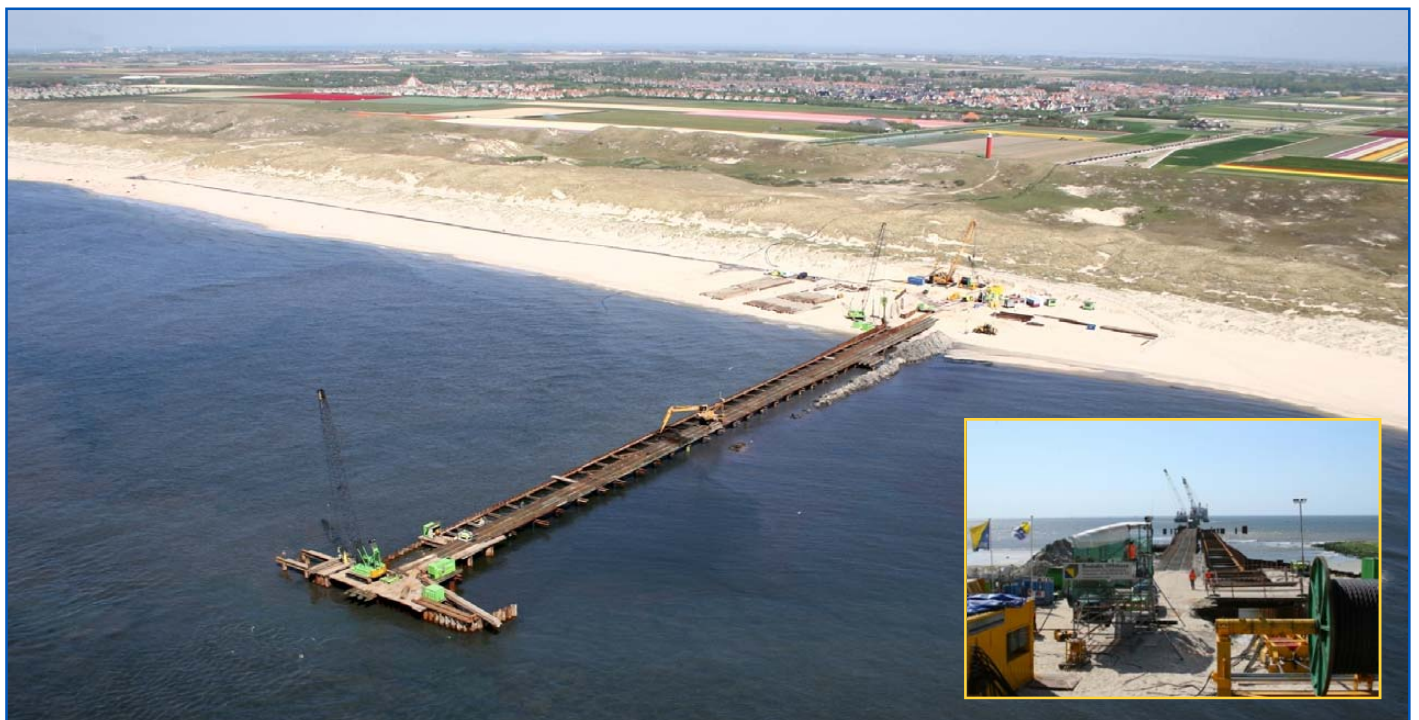
### Shore approach at Julianadorp

The scope started at the tie-in to the HDD dune crossing on the beach. Planning of activities on the beach required careful consideration with regard to the sensitive dune areas adjacent to the project site and tourists on the beach during the summer season. From the beach a 300 metres long sheet piled cofferdam was installed to facilitate trench excavation through the surf zone. From the offshore end of the cofferdam a trench was dredged up to 7 kilometres offshore.



Location map.

Excavation of trench by specially modified excavator; Inset: Pipepull operations.





Installation of sheet piles and trenching by TSHD "Argonaut".

Trenching operations by TSHD "Waterway" and "Argonaut".

This scope also included the supply and operation of a 500 tons capacity linear pull winch and pull wire installation to facilitate the beach pull operations. Upon completion of the pipeline installation, the trench was backfilled, the cofferdam removed and the beach re-instated.

**Cofferdam and winch platform**

On the beach the activities started with the installation of a 300 metres long and 5 metres wide temporary bridge to be used as access road during the cofferdam installation works. Close to the dunes, a winch platform constructed of sheet piles was installed to protect the equipment at high tides.

The 5 metres wide trench inside the cofferdam was excavated by means of a specially modified excavator driving on the temporary access bridge. Excavated material was temporarily stored adjacent to the cofferdam and later re-used as backfill material.

**Pipeline pull-in**

The winch was used to pull the pipe from the lay barge to the shore. Boskalis was also responsible for the accurate installation of the 4" steel pull wire from the winch, through the trench, up to the recovery point some 800 metres offshore.

**Offshore trench dredging and backfilling**

The offshore trench was dredged by Trailing Suction Hopper Dredgers (TSHD). The shallowest part was dredged by TSHD "Sospan Dau"; TSHDs "Argonaut" and "Waterway" dredged the sections in deeper water. The trench with a bottom width of 5 metres was dredged to ensure a cover on Top of Pipe of 3 metres. A total volume of approximately 600,000 m<sup>3</sup> of sand and clay was dredged and discharged at a designated temporary storage area for later re-use during the backfill operations.

Upon completion of the pipe lay operations, the offshore trench was backfilled to original seabed level by TSHDs "Coronaut", "Argonaut", "Sospan Dau" and "Sospan".

**Tie-in**

The final connection between the dune crossing and offshore pipeline was made by means of a tie-in at the beach. This tie-in, including field joint coating and testing of all welds was carried out in an 8 metres deep sheet piled tie-in pit.

**Beach re-instatement**

Upon completion of the pipe pull, backfilling of the trench was carried out. Finally the cofferdam, winch platform and access bridge were removed and the beach and dunes were re-instated.

**Pre-sweeping and Rock Dumping**

Pre-sweeping was carried out by TSHD "Oranje", equipped with multibeam survey equipment, enabling the vessel to operate on a stand alone basis. The "Oranje" dredged 381 sand ridges in water depths up to 50 metres.

The Dynamically Positioned Fall Pipe Vessel (DPFV) "Sandpiper" executed rock dumping works at 8 cable crossings and 5 pipeline crossings along the pipeline route. In total 26,654 tonnes of rock was installed. DPFV "Seahorse" performed rock dumping of 33,935 tonnes at a free span section.

The project was completed under typical, unstable, North Sea conditions, but nevertheless to client's complete satisfaction.



Tie-in pit and TSHD "Sospan Dau" backfilling.