

## REPUBLIC OF CUBA

### BOCA DE JARUCO

The Boca de Jaruco field is located on the north coast of Cuba, 30 km from Havana. The contract area of 37 km<sup>2</sup> is located in the north-western part of the field on the sea shore, 3.7 km west from the village of Boca de Jaruco. The field was discovered in 1969 and has been operated by the Cuban state oil company CubaPetroleo.

Zarubezhneft JSC carries out its activities as per the International Economic Association Agreement (IEAA) on increasing of oil recovery and share production dated June 24, 2011, as the contractor. The Agreement term is 25 years and includes two stages: Pilot Commercial Development Stage – commercial development stage 4 years (with a prolongation option for 4 years) and the Exploitation Stage. The primary method of enhanced oil recovery is well steam treatment.

In August 2018, Addendum No. 4 to the IEAA came into effect, which provides financing of local services and materials and equipment during the pilot commercial development on the M formation for 2 years by means of the Special Account, a non-written-off part of Cuba debt as per the Agreement between the Government of the Russian Federation and the Government of the Republic of Cuba on adjustment of the debt of the Republic of Cuba towards the Russian Federation for loans granted in the former USSR period, dated October 25, 2013.

#### EXPLORATION AND EXPLOITATION OF FACILITIES

In 2019:

- 8 cyclic steam treatments out of 8 planned treatments were performed;
- 23 thous. tons of steam were injected into the M formation;



#### Ownership structure, %



- steam to oil factor in the BKh-3003 well reached 3.9 tons of steam/ tons of oil (reduced by 7 times from the initial level);
- workover completed for wells 3002 and 3001 to include bitumen-saturated tight streaks;
- tests of the innovative development started – intraformational oil upgrading by catalytic aquathermolysis at the BKh-3003 well;
- gas well cluster development started, the following facilities were built: OHV 33kV; Cluster M – GW Cluster oil pipeline, Cluster M – GW Cluster gas pipeline to supply gas to the mobile single-flow steam-generating plant (MSFSGP); and water line to supply MSFSGP;

- two (out of three) horizontal wells have been drilled – 3004 (with cutting samples that revealed bitumen saturation of a section above the M formation) and 3006 (with sampling 180 m of core in the pilot borehole), where two technologies will be tested: cyclic steam treatment and steam gravity drain. Drilling of the first horizontal well for the M formation was started on October 4, 2020 by D. A. Medvedev, Chairman of the Russian Federation Government;
- drilling of the third horizontal well 3006 started;
- total penetration in 2019 was 3,650 m;
- a base for reserves calculation was prepared as part of the scientific support and researches.

When implementing renewable energy source projects in Cuba, an agreement was signed with the Union Nacional Electrica (UNE), and Zarubezhneft JSC was registered as a participant of the Solar Power Frame 100 MW project. Agreements were signed with Norsk Solar (Norway), EMPower and UNE, as well as the Consortium Basic Conditions between Zarubezhneft JSC, Norsk Solar and EMPower. Cuba have provided for technical information on 17 locations where solar power

plants are planned to be constructed, the suggested sites have been inspected. A preliminary scheme of the project implementation was prepared.

**DEVELOPMENT PROSPECTS**

Plans for 2020–2022:

- completion of the drilling of three horizontal wells (CSS+SAGD) in 2020 and of the fourth (additional) well BKh-3007 with the aim to test the upper (above the M formation) bitumen-saturated zones with drilling of the M formation;
- continued steam treatment of current wells;
- testing of the cyclic steam treatment technology in a horizontal well and the steam assisted gravity drainage (SAGD);
- pilot testing of the intraformational oil upgrading by catalytic aquathermolysis;
- definition of the 100 MW SPP construction project.

Until August 2020, the project is being implemented with co-financing by the Special Account for local costs; an agreement has been reached to prolong these conditions until the end of the production testing.

Since 2023, full-scale development of the M formation starts, with drilling of 7 wells in 2023 and further switching to more prospective reserves with additional exploration of the formation (increasing the formation coverage to 60 horizontal wells).



**Capital investment, MM RUB**

**+166 %**

