EQUALIZER Technology Improved Water Injection Profile in a Deepwater

Increased oil rate in Campos Basin, Brazil

Benefits

- Delivered an enhanced injector well in less time, with less risk and with a more effective cost expenditure compared to the traditional water injector well completion method
- Improved injection profile compared to a conventional completion method
- Increased production and recovery impact on neighboring producer wells

Background and challenges

- Client needed to improve injectivity and increase the water sweep efficiency in a water injector well in a highly friable formation
- Campos Basin, Brazil

Baker Hughes solution and results

- EQUALIZER screen to provide the equalized water injection profile to efficiently distribute the acid treatment for a fast and effective removal of the filter cake
- Deployed in one trip, avoiding gravel packing and allowing a bullhead pumping for the acid job, saving significant rig time
- Delivered a homogeneous flow distribution, balanced the injection across the horizontal section, and improved the injection profile compared to a conventional completion method

The strategy was to improve water injection for reservoir energy maintenance and to inject water into the oil leg concentrated in the lower portions of the reservoir, while production is concentrated in the upper parts, to delay water breakthrough. It included pressure maintenance and sweep efficiency for three adjacent producer wells, avoiding water channeling and earlier breakthrough, by uniform water injection along the openhole horizontal section of the well.

The EQUALIZER™ screen was the foundation of this project. In the past this technology was only applied to increase the oil recovery in producer wells by delaying water breakthrough, for this project, the EQUALIZER screen provided the equalized water injection profile to efficiently distribute the acid treatment for a fast and effective removal of the filter cake. Deployed in one trip, not requiring gravel packing and allowing a bullhead pumping for the acid job, this technique saved significant rig time. The injection rates were from 2,000 to 5,000 m³/day, starting with higher rates to enhance reservoir pressure and displace an oil bank to the target producers.
Injection logging operations were performed to verify the performance of the EQUALIZER screens after the installation. The results were conclusive: the EQUALIZER screen provided a homogeneous flow distribution, balancing the injection across the horizontal section, delivering an improved injection profile compared to a conventional completion method.

The high injectivity index results obtained after the injectivity test conducted in the well confirmed the efficiency of the EQUALIZER screens to perform the acid treatment as well.

Since the water injection started in April 2007, a positive impact on the neighboring producer wells was noticed. The closest oil producer well to the referred water injection well presented good evidence of water injection efficiency, i.e., oil rate increase and water cut decrease after the injector well was brought online.