Extending Desfiladero Bayo Field Life Cycle—Study of Polymer Flooding and Pilot Test

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Abstract

Desfiladero Bayo is a mature field under secondary recovery with high water cut located in the Neuquen basin. This field produces oil of multiple commingled reservoirs and in order to extend their life cycles, it was decided to conduct an EOR development. The Rayoso formation is at first glance a good candidate to apply Polymer Flooding due to its favorable mobility, salinity and temperature conditions, according to the successful projects with the same technique around the world.

From this screening it was decided to I for session mplement a pilot project and a detail model from the field with a multi-disciplinary team, integrating all parties involved in subsurface description and field operations.

Operationally, the project required performing an array of line-drive type secondary recovery by drilling three additional wells and converting four wells to injectors. Facilities were also built to allow measuring the incremental production in three producing wells, following an accurate monitoring plan.

This work attempts to reflect the different stages and lessons learned from the conception of the project until the beginning of implementation of the pilot. Among the issues that are worth highlighting are the selection of the pilot area, the selection of the polymer, the need to generate a detailed study of the involved reservoirs and the operating problems related to the commingled production in the field. During the dynamic modelling, an original adjustment technique was applied due to the characteristics of the water injection history, since we used fresh water and purge water that alter the salinity and thus the resistivity responses.

The correct implementation of a pilot that validates the results obtained in this work, in conjunction with the regional study of the Rayoso formation, will allow the expansion of this type of enhanced recovery in this formation in surrounding fields and therefore cause a high impact in the company reserves.