Implementation of Chemical EOR as Huff and Puff to Improve Oil Recovery for Heavy Oil Field by Chemical Treatment SEMAR Cast Study Bamboo Oil Field

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DOI

http://dx.doi.org/10.2118/182792-MS

Document ID

SPE-182792-MS

Publisher

Society of Petroleum Engineers

Source

SPE Kingdom of Saudi Arabia Annual Technical Symposium and Exhibition, 25-28 April, Dammam, Saudi Arabia

Publication Date

2016

Abstract

Bamboo field is located in block 2A Muglad Basin covers an area of 144 Square km. It consists of multi block, multi-layered under-saturated sandstone reservoir of late Cretaceous ages barried at depth ranging from 1000 m to 1700 m with crude oil viscosity ranges from 70 cp to 3000 cp. The total Field STOIIP and Recovery Factor (RF) are currently estimated at around 506MMSTB and 18% respectively through primary depletion. Up to date; the field had recovered more than 75% of the EUR.

The field initially produced around 20,000 STB/Day with early water breakthrough and very minimal gas production rate until today. However the production rate declined rapidly when the water production rate increased. Major factors that contributed to this problem are possibly due to the fingering and water conning. Currently the field is producing around 8000 STB/Day with water cut around 80% and keeps increasing.

Schemes in enhancing and prolonging the already decline production and diminishing reserves strategically call for timely implementation of Enhanced Oil Recovery (EOR) process. Among various Enhanced Oil Recovery (EOR) process and techniques, Bamboo reservoirs appear especially amenable to thermal injection process. But Sudapet, ITB and PERTAMINA (an especial study) came up with different solution which is Huff and Buff of Chemical EOR, This proved to be one of the practical, promising and potential options in enhancing the recovery factor in Bamboo Field.

This paper will discuss the lab study scope, includes the core sample, fluid sample, phase behaviour test, spontaneous Imbibition Test, Compatibility test, Viscosity Mixture and core
flood, well selection analysis as well as the implementation of SEMAR as pilot project in Bamboo Oil Field.

After implementation of the pilot as Huff and Puff in three wells the results show that about 18,000 STB of oil gained from adjacent wells, which indicate that SEMAR is very interesting to be evaluated for further steps in chemical EOR implementation for continuous Injection.