

Lessons Learned from Recent Post-Frac Drawdown-Buildup Tests: A Review of Case Studies in Middle East Tight Sands

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ABSTRACT

Saudi Aramco is actively appraising the numerous unconventional shale and tight sand opportunities located across the Kingdom of Saudi Arabia. The early phase of the unconventional gas program in the company has been directed towards exploration data gathering activities through drilling, coring, open-hole logging and completion of shale and tight sand gas resources. Due to the tight nature of these reservoirs, several vertical and horizontal wells have been drilled and completed with multistage hydraulic fractures to unlock these unconventional resources. Initial post-frac flowback tests, in addition to long-term pressure build-up, have already been conducted on several of these wells, the analysis of which will help to characterize and better understand these tight hydrocarbon reservoirs. This paper presents findings and key lessons learned from conducting and analyzing several long-term pressure build-up tests on tight sand reservoirs in Saudi Arabia. From these field case studies, recommendations on post-frac flowback management plan, design of drawdown and build-up tests are presented. Production history and pressure transient analyses are two main sources for reservoir characterization. Evaluation of hydraulic fracture geometry in conjunction with the characterization of these tight reservoirs during the exploration and appraisal phase will later facilitate an optimized completion design for the lateral length, number of clusters and the inter-well spacing during field development.