

Completing a Deep Unconventional Well with Wellbore Limitations in Saudi Arabia: Case Study

Ali Al Saihati¹

¹Saudi Aramco

ABSTRACT

Overcoming high near wellbore (NWB) friction and pressure-dependent leakoff (PDL) is universally recognized as a challenge to successful hydraulic fracturing treatments. Furthermore, well construction and mechanical completion limitations can impose additional constraints that further limit the treatment options available. The combined effect of these challenges can often result in limited evaluation of prospective intervals.

Exploration drilling programs often result in multiple targets being penetrated and evaluated in an environment where significant uncertainty can exist with respect to formation pressures, formation stability, and best drilling/completion practices. As a consequence, the measures taken to safely drill and complete an exploration well in a challenging high-pressure/high-temperature (HP/HT) environment can impose significant limitations on the subsequent evaluation program(s).

This paper describes the challenges posed by well construction, high NWB friction, and PDL and how those challenges were overcome to successfully perform multistage hydraulic fracturing treatments in an unconventional gas exploration well for Saudi Aramco.