

Case Study



UNOGASsm Technology in Producing Wells

Reducing Water Production in a Naturally Fractured Gas Well Using Sequential Gel/Gas Slug Injection (SPE 59746)

Situation

Controlling and eliminating unwanted water influx into natural gas wells is a major concern of natural gas producers. Water influx can occur via several mechanisms (flow through fractures, channeling, or coning), and the water may approach from several directions (from below, from the sides, or from above). Usually water is produced at the cost of gas recovery, and, in severe cases, the water influx becomes so great that the gas production is choked off completely.

Program

The 127.5 m³ of gelant and 17,700 scm Nitrogen treatment was placed using a bullheading technique, in a highly deviated wellbore with a relatively large tubing diameter and open hole completion.

Surface pressure increase during the treatment application suggested significant build-up of resistance to flow in the formation surrounding the wellbore. It is possible that the gas column was not completely displaced with gelant during the treatment application due to the large diameter tubing and horizontal orientation. A successful treatment was still achieved.

A reasonably large volume of gel was placed at low concentrations suggesting the treatment was near optimum. The initial post treatment blowdown failed, but the second was successful, making a post-treatment wellbore cleanup unnecessary.

Results

The water shut off treatment on the Sukunka C-1-C gas well was successful. The post treatment WGR was decreased by approximately 75%, while gas rates increased from 20% to 70%. The total cost of the workover including the gel treatment was paid out in 4 months, based on the incremental gas production.

The effects of the gel treatment have lasted nearly 12 months to date. The WGR has recently been increasing, however, the well continues to produce economically.

Pre- and Post-Gel Treatment Production

