Title: Field Trial and Application of the Liquid-Assisted Gas-Lift on a Producing Long-Horizontal Well

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OBJECTIVES/SCOPE:
Well-test data for a 20,000-ft long horizontal well will be presented to show the application of the Liquid-Assisted Gas-Lift (LAGL) technology for a producing unconventional reservoir. This field trial demonstrated that a long-lateral well can be unloaded using the LAGL method with surface pressures not higher than 1,000 psi without any downhole equipment, in less than 10 hours.

METHODS PROCEDURES, PROCESS:
A modular unit capable of unloading wells using an automated system was deployed in this field demonstration of the LAGL method. This unit only used produced water and natural gas used for conventional gas lift to unload this well. No downhole equipment was used during the unloading operation using the LAGL method. Only downhole pressure transducers were used to confirm the well unloading. The reservoir was approximately 8,000-ft deep and the lateral horizontal section was about 12,000-ft long, which was often loaded by frac hits from nearby wells.

RESULTS, OBSERVATIONS, CONCLUSIONS:
The well operator was constantly struggling to keep this well unloaded using high-pressure gas-lift (HPGL) method, mainly because of problems with the high-pressure boosters needed for HPGL. This well was often liquid loading due to frac hits from nearby wells. The LAGL automated unit fully unloaded this 20,000-ft long well in approximately 8 hours. The well operator would normally take days to unload the well using HPGL. The unloading was accomplished using the automated system built in the LAGL surface unit.

The field data from the pilot test shows that the injection pressure to unload the well using the LAGL technology is significantly lower than the single-point high-pressure gas-lift method. The results from a transient multiphase flow simulator were also validated for the unloading operations for all the well tests performed in this field trial. The validation of transient simulations is important to show the validity of simulation results for future application and design of the LAGL technique for other wells.

For the first time, field data for a producing well for a complete unloading operation will be presented for the LAGL method. The LAGL method can lower CAPEX/OPEX, improve productivity and increase safety. In addition to that, it is the first time that detailed simulation data is shown for the LAGL method for producing wells.