With the increased global demands on oil and gas, operators strive to maximize production by conducting more advanced drilling operations, such as extended reach, horizontal and high-pressure/high-temperature (HP-HT) drilling and are expanding globally into drilling unconventional resources. Unconventional gas resources offer significant gas production growth potential in the coming years, currently accounting for 43% of the US gas production. Tight Gas Sands (TGS) represents approximately 70% of the unconventional production and significant reserves are yet to be developed.

However, economical production of TGS is very challenging as it exists in reservoirs with micro-Darcy range permeability and low porosity but has a huge potential for production in the future. Poor permeability results in lower gas production rates from TGS reservoirs. In order to economically develop TGS resources an advanced technology has to be developed and implemented. Most of the TGS reservoirs are characterized by being thick (hundreds to thousands of feet thick) and multilayered where their gas production rates can be enhanced by hydraulic fracturing. Although service companies have large capabilities for conventional/unconventional reservoirs but the used technology to drill, complete and stimulate tight gas reservoir is quite complex and the results are often unexpected and unforeseen. The appropriate completion methods and stimulation techniques in these reservoirs are dependent on many parameters and variables, such as depth, pressure, temperature, capillary and overburden pressures and the number of sand layers.

This paper takes a multidisciplinary approach to better understand how gas can be produced from tight gas sand reservoirs and provides a technical overview of the state-of-the-art technology used to develop those reservoirs and address their challenges. Two real case histories will be presented; Travis Peak formation in eastern Texas, USA; and Risha gas field in eastern Jordan.

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