

Historical and Recent Trends in Wells, Fracturing and Completions in US Major Shale/Unconventional Plays

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ABSTRACT

This paper will cover specific data for the major US shale/unconventional plays for 2005 through 2016. Data includes completed wells, average IPs, lateral lengths, frac stages, volumes of fluid and proppant. plots of decline for the first 18 months of production, and types of completions. All data is analyzed and author's comments/observations/conclusions are provided. Modern data mining procedures were employed to obtain data from subscription, public and proprietary sources. Data were then organized, separated by shale oil and gas plays and then plotted. The author used his knowledge, experience, and previous publications on shale and unconventional to analyze the various plots to make observations, develop comments and draw conclusions from the result. An historic event happened in 2014, when a total of 20,400 unconventional horizontal wells were completed. The downturn in the industry in 2015 halted significant increases in shale production and the number of well completions. In 2016 only 4,275 shale/unconventional wells were completed - reflecting an 80% drop in two years. During the short 11 years of shale history the US developed “the model” for the world for shale development, the multi-stage hydraulically fractured horizontal well using modern fracturing techniques and completion equipment. Longer laterals, higher numbers of frac stages and doubling of volumes of frac fluid and proppant have yielded wells with higher IP's year-on-year in all shale oil plays and most shale gas plays. The industry may not have fully optimized fracturing techniques and placement of wells in the reservoir to ensure that 100% of frac stages contribute to individual well production, but progress is certainly being achieved. The year 2012 appears to be pivotal as to when the industry arrived at the use of modern completion equipment and fracturing techniques. In 2015 it was observed that certain data, especially gas wells, did not follow the increasing trends, but this is attributed to possibly a small data set. The industry media have published bits and pieces of these data on the trends in shale plays, but to the author's knowledge, there has not been a single document that collects it all together, covers the 11 significant years, compares, comments and draws conclusions on the shale trends.