QUICK NOTES

INTERVENTIONLESS SLEEVE SYSTEM IN THE PERMIAN IMPROVES NET PRESENT VALUE (NPV) WHILE INCREASING PROVED UNDEVELOPED (PUD) ACREAGE

A 2023 multi-well completion campaign by a Permian operator, utilizing pinpoint (single entry) frac technology in a hybrid-conventional dolomite formation, results in an increase of cumulative oil production while reducing cumulative water production on a per-foot basis in a Child versus Parent well.

BOWHEAD™ SINGLE POINT FRAC

OPERATOR OBJECTIVES

- Utilize lessons learned during previous drilling, well construction and completion optimization trials to limit the negative impact on the parent well production while delivering an economically viable addition to existing production
- Increase frac efficiency and control to 100% at each entry point and overcome formation leak-off during frac with 8-10x rate per entry point when compared to industry standards
- Eliminate traditional high-risk and expensive post-frac drill out operations while reducing unnecessary water on formation thus shortening well cleanup and time to sales

JOB EXECUTION

After landing production casing and Bowhead interventionless sleeves, conventional cementing jobs were completed on each well, as per standard cementing practices. At time of frac, a stabilized injection rate, through various manufactured toe sleeves, was established. For each sleeve, a unique paired collet with ball in place was launched and tracked to target sleeve using high-resolution acoustic and pressure sensors. After observing unique signature of collet seat, shear and subsequent sleeve opening, high intensity fracs were performed through each sleeve. Multiple launcher configurations were used for continuous pumping with no discernable differences in operational efficiencies. Stage over stage isolation was achieved utilizing degradable, acid resistant, coated balls selected specifically for operator's source fluid and low (105°F) BHT. Additional fluid on reservoir during post frac intervention and upper completion, was minimized with reduced time to sales, post frac.

BY THE NUMBERS

137,000 ft of Lateral Stimulated

840 Stages of Bowhead Sleeves

170,000 lb per Stage of Proppant Pumped

Slurry Rate of **95 bbl/min**

+80% Cumulative Oil Production

-20% Cumulative Water Production

BOWHEAD is a multistage single point entry frac system offering a near limitless number of fracs per well. Cemented or uncemented, this system allows operators to target optimal spacing and distribution while providing unprecedented confidence in valve-opening accuracy.

01

Single Point Entry
A cementable multi-stage single point entry frac valve system offering near limitless fracs.

02

Continual Pumping
Individually profiled collets pumped with dissolvable balls result in continual pumping.

03

Safer, Smaller
Large-bore, fluid-conveyed collets eliminate the need for wireline, coiled tubing and perforating guns at the wellsite.

STAGE COMPLETIONS

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