

CASE STUDY



Permian Operator Uses New Technology to Reduce Completion Costs

Steward Energy is a private exploration and production company, headquartered in Frisco, Texas. Currently holding acreage on the Northwest Shelf in Texas and New Mexico, Steward is considered a leader among operators for their strategic development and re-development of San Andres assets.

Steward Energy's pursuit of creating value has led them to trial game-changing Stage Completions Bowhead technology in the San Andres formation. The system provided efficiencies leading to significant reductions in operations time, water usage, and overall cost, and resulted in increased production.

Historically, Steward Energy has employed plug and perf operations for San Andres development. Several offsets had been completed successfully with wireline, plugs, and perforations and were prepared for

production by milling out plugs with jointed pipe. In the trial well, instead of planning for plug and perf completions, 31 single-point entry full-bore ID Bowhead valves were installed along the mile-long lateral and cemented in place.

In October, 2021, Steward completed the trial well through the interventionless Bowhead completion system in 32 hours – **less than half the frac time of average plug and perf** for offset wells in the same infill development program. This, combined with the elimination of drill outs **saved over 16,000 gallons in diesel fuel usage.**

During the completion operation, individually profiled collets with dissolvable balls were pumped downhole to open each Bowhead valve separately. No shutting down was required as the collets were launched directly into the frac stream

Steward Energy Trials
Stage Completions Bowhead System
in San Andres Formation
March 2022 - Yoakum County, Texas

Cost-Saving Technology

Stage Completions offers a suite of fully customizable limited entry and single-point entry completions systems which eliminate the requirement for wireline, coiled tubing and/or service rig operations. The field-proven interventionless completion systems use reliable mechanical technology to allow for continuous pumping, translating to time and cost savings throughout the entire operation.



at the wellhead, allowing each frac to begin immediately as the previous flush left surface. Continuous pumping capabilities, along with single-point entry frac design, and elimination of fluids for pump down and milling resulted in a reduction of over 40,000 bbl of water used on the completion – **a 34% decrease in water usage** compared to offsets.

During the stimulation, the isolation balls were seated on the collet and provided an effective hydraulic seal with applied pressure; but once completion operations concluded, the benefits of the dissolvable ball technology were truly apparent. Immediately after hydraulic fracturing operations, the balls easily flowed off seat and dissolved completely, leaving a large-bore lateral ready for production without drill-out or intervention. Tests were performed pre-job ensuring the complete dissolution of the ball in the planned completion fluid and downhole conditions. The ESP started operating 4 days after the frac on the first stage began, representing a **52% reduction in days from frac start to production** when compared to offsets, all of which required drill-out operations to remove plugs.

Production results from the Bowhead trial well have exceeded expectations, with an **11% increase of initial production** compared to offset wells.



“The Bowhead sleeve system is a game-changer for us. With significant time, water, fuel, and cost savings, it has helped take our completion efficiencies to the next level. The added benefit of not having to drill out plugs or ball seats allows us to get the well on quicker and further reduces risk of problems during drill out operations.”

-Tim Hilton
VP Operations at Steward Energy

The trial well was drilled with reduced spacing and as a result had two direct offsets in the area. Single-point entry pumping design allowed full placement of the treatment **without any interference** to the offset wells – an effort not typically achieved with the same spacing in the area. By using the Bowhead system, Steward realized

significant time, logistics, and material improvements that **reduced total well cost by 12%** compared to offset wells while also exceeding production expectations.

Due to the success of the trial well, the company plans to utilize the valves in a large portion of their future wells. This ambitious strategy should result in meaningful savings of cost, time, resources, and risk while offering a promising production enhancement.

Pin-Point Accuracy

Using Bowhead technology allows operators to access the reservoir with predictable and repeatable distribution. The combination of lock-and-key technology and precise acoustic monitoring validate the placement and operation of the strategically spaced entry points throughout the lateral.