

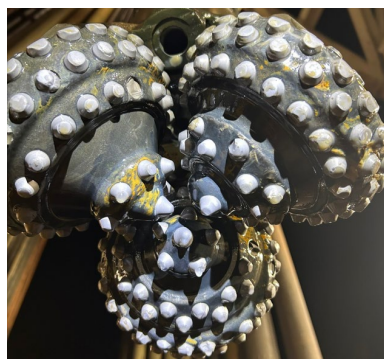
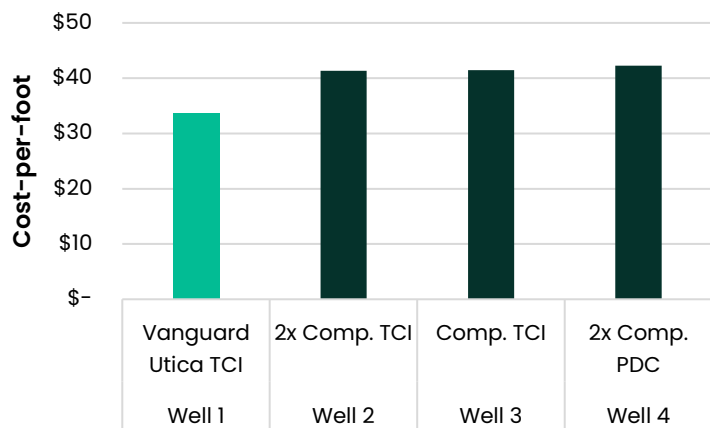
Vanguard Utica tricone delivers lowest cost-per-foot on pad, drills 12.25-in. air section with 26% higher ROP

CHALLENGES

- Air drilling
- Extended section length
- High tangent angle directional profile
- Bit damage drilling through interbedded hard carbonates and sandstones
- Improving ROP

SOLUTION

- Vanguard™ Utica air performance tricone drill bit
- Advanced carbide inserts better resist damage through challenging formations
- Optimized cutting structure for Utica air drilling applications
- Vanguard air bearing and seal package for extended reliability



Dull Condition
2-3-WT-A-E-2-BT-TD after
5627ft drilled at 91.5 ft/hr

RESULTS

One fast run
to section TD

19% lower
cost-per-foot
compared to next best section

26% faster ROP
than other 1-run to TD TCI bit

9.5 hours saved
compared to next best section

\$46K saved
compared to pad average