

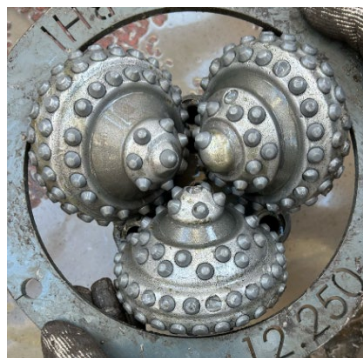
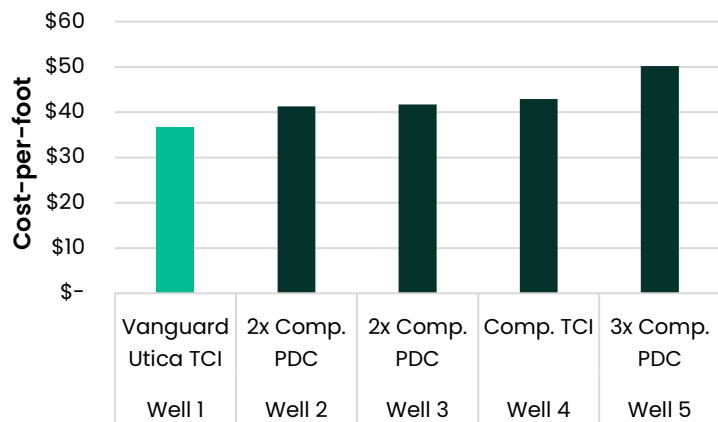
Vanguard Utica tricone drills fastest 12.25-in. air section and lowest cost-per-foot on 5-well pad

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-1-BT-TD after
6018ft drilled at 99.5 ft/hr

RESULTS

One fast run
to section TD

11% lower
cost-per-foot
compared to next best section

13% faster ROP
compared to next best TCI bit run

11 hours saved
compared to next best TCI bit run

\$45K saved
compared to pad average