CASE STUDY

MICROGUIDE REVEALS CAUSE OF FAILURE AT PREVIOUS ESP LOCATION AND PROVIDES RECOMMENDATION FOR NEW PLACEMENT

TECHNOLOGY

- MicroGuide™ wellbore tortuosity logs

APPLICATION

- Artificial lift
- ESP placement

LOCATION

- Permian Basin (Reeves County, Texas)

INDUSTRY CHALLENGE + OBJECTIVE

An operator in Reeves County had a producing well on an ESP, but when the pump failed and was no longer able to surface fluid, they needed to replace it. After determining a proposed set depth for the new ESP based on available MWD data, the operator requested that we confirm the viability of that location and overall wellbore quality with our MicroGuide tortuosity logs.

TECHNOLOGY + SERVICE SOLUTION

- We recommended performing a comprehensive MicroGuide logging analysis to provide true insight into tortuosity from surface to the kickoff point.
- Taking measurements in 1-ft increments versus stand-length intervals provides a detailed picture of true downhole conditions and issues that might be causing problems with artificial lift equipment.

RESULTS + VALUE DELIVERED

- The MicroGuide data revealed that at the original set depth of 8,874 ft, there was an area where the effective diameter dropped to .84 inches (**Fig. 1**). This is what caused the first pump to fail, highlighting the challenge of placing artificial lift equipment with limited data on wellbore conditions.
- We found that at the operator's proposed set depth of 8,666 ft, the maximum effective diameter of a 176-ft pump was 3.78 in., which was below the pump diameter of 4 in. and could lead to another failure in the future (**Fig. 2**).
- Though we were able to recommend several alternative set depths with maximum effective diameter closer to 4 in., there was no perfect area to place the ESP within 2,000 ft of the operator's proposed set depth. As such, we recommended they use a shorter pump (150 ft), which would allow for a maximum effective diameter at our suggested set depth of 8,676 ft (**Fig. 3**).

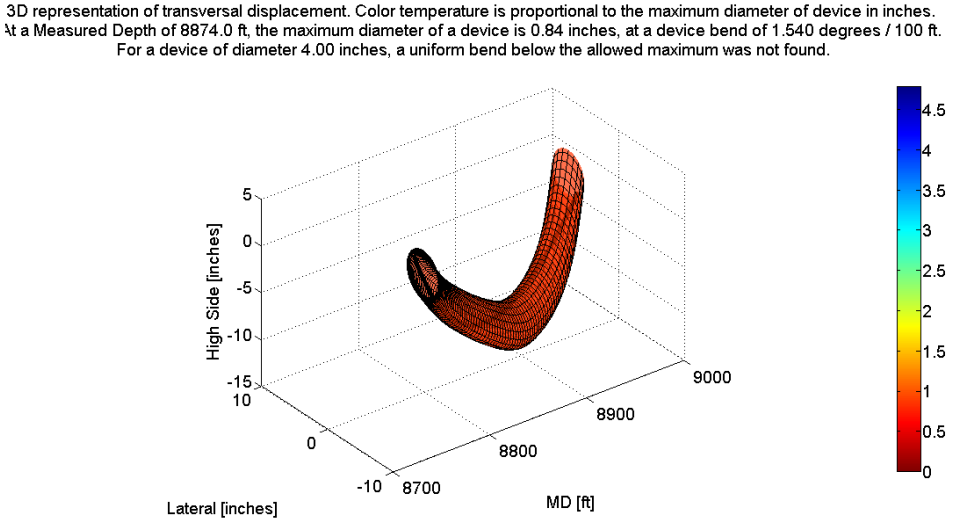

Fig. 1—The original ESP placement caused premature failure due to its location in an area where the effective diameter dropped to less than an inch.

40 gyrodata YEARS OF INNOVATION

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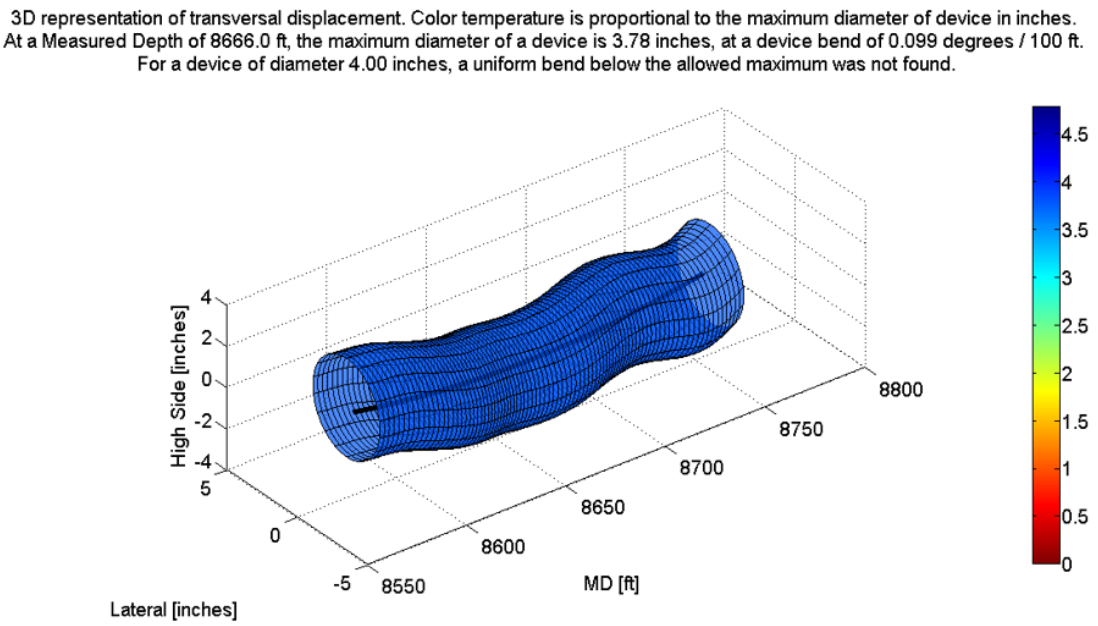

Fig. 2—At the operator's proposed set depth, there was much less tortuosity in the well, but the pump would still fail as there was no uniform bend below the allowed maximum.

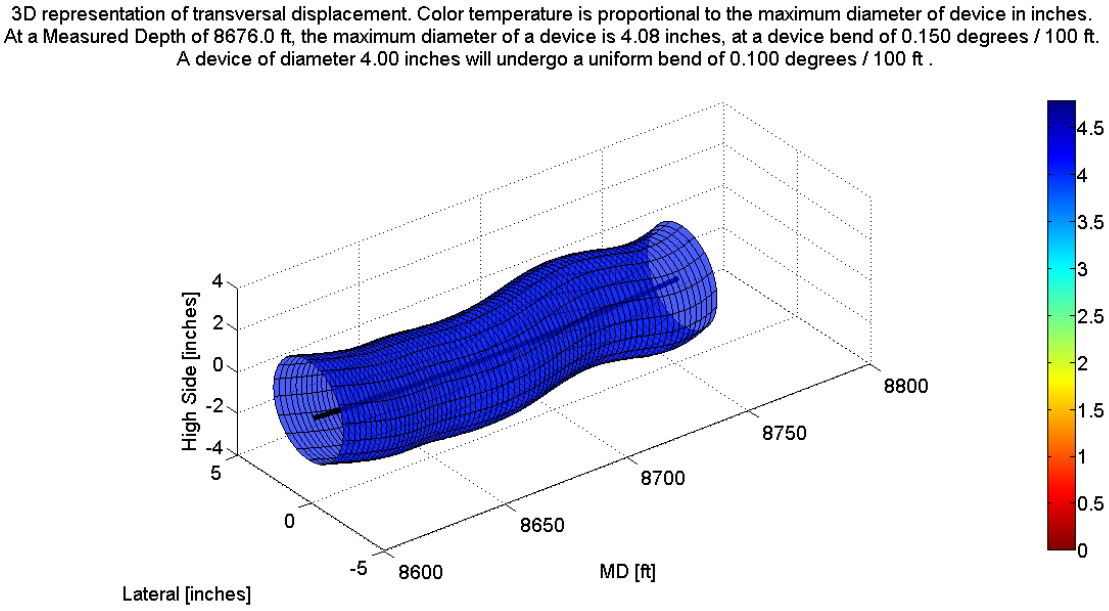

Fig. 3—At our suggested set depth and with a shorter pump, it would be possible to place the ESP without risk of premature failure.