Case Study

Pegasus Series Drill Bits

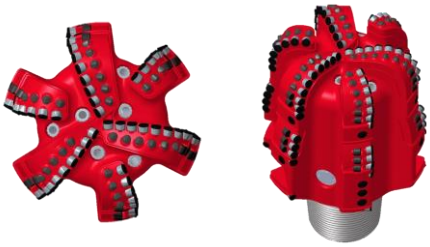
Pegasus™ delivers exceptional performance in New Zealand Geothermal Application

Challenge

The 12 ¼" section in the New Zealand project proved to be a challenging geothermal application characterized by high abrasive wear, gauge issues, high torque and extreme downhole temperatures.

Solution

NOV ReedHycalog combines industry-leading technologies in the 12 ¼" E1439 bit design. The patented dual-diameter design improves drilling efficiency by allowing the pilot to pre-fracture the formation while the reamer then drills stress-relieved rock to maximize lateral stability. The MaxSteer™ feature maximizes drilling agility and steering potential. Robust cutter geometries reduce torque, extending drillability and durability of the bit in geothermal applications.

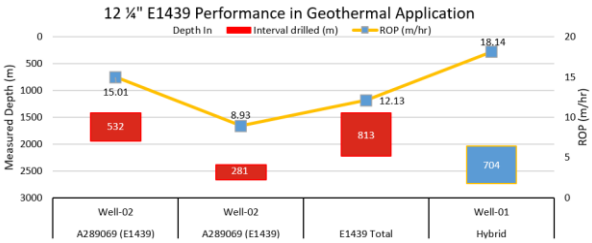


The 12 ¼" E1439 Pegasus Series Drill Bit achieved all objectives in its maiden run in the geothermal application.

Results

The 12 ¼" E1439 SN: A289069:

- Drilled a total interval of 813 m (2,667.32 ft) with an ROP of 12.13 m/h (39.80 ft/h) – 15% longer than the offset bit
- Achieved all the direction requirements of the bit run
- Exhibited better dull condition than the offset bit with a dull grade of 1-3-BT-S-X-I-WT-TD versus 1-8-RO-G-X-3-BT-HR
- Delivered smooth torque and steady drilling throughout the run
- Resulted in excellent tool face control and < 5% sliding with most of the long tangent section drilled in rotary mode
- Completed the first run of 532 m at 15 m/h (1,745.41 ft at 49.21 ft/h) on a PDM BHA
- A hot influx of >168°C was detected at 2,382 m (7,814.96 ft) and directional BHA was POOH to save MWD/PDM tools
- Completed the second run of 281 m at 9 m/h (921.92 ft at 29.53 ft/h) on "blind" rotary BHA to TD at 2,663 m MD



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Case Study

Pegasus Series Drill Bits

Pegasus™ Series Drill Bit delivers outstanding, all-around bit performance in New Zealand Geothermal Application

Challenge

Historically, the 16″ geothermal section was a roller cone application until the introduction of hybrid and PDC drill bits in recent years. Bearing life and ROP limitations associated with roller cone and hybrids, along with high torque and gauge durability of traditional PDC bits are key factors when selecting drill bits for this hole section.

Solution

With the goal to drill the section in one run, improve ROP, and produce a re-runnable bit dull grade, the Pegasus 16″ E1426 was selected. Designed to dominate the most challenging drilling applications, including geothermal, the bit is a shankless MaxSteer™ design with enhanced gauge length, Struts™ high-density impreg elements, the latest ION+™ PDC cutter technologies, and a patented dual-diameter cutting structure.

Combining industry-leading technologies, the Pegasus 16″ E1426 achieved a new field ROP record and outstanding footage performance.

Results

This premium bit design delivered a shoe to TD run on the field's second longest section in this geothermal field. The bit achieved a new ROP benchmark of 22.5 m/h (73.82 ft/h), improving on the previous best ROP by 13.75%, and was pulled in excellent re-runnable condition.

The 16″ E1426:

- Drilled a total interval of 854 m (2,801.84 ft) in a single run from casing shoe to TD
- Achieved all bit run objectives
- Had lower torque signature than standard PDC designs with no torque issues
- Pulled in gauge after the performance PDM run on a 1.15° bent housing setting
- Produced an outstanding re-runnable dull condition of 1-1-CT-C-X-I-NO-TD