

Case study: Southern Europe

# The Vulcanix geothermal tricone drill bit set ROP and footage record in geothermal field

An experienced operator in southern Europe wanted to drill an 8½-in. section faster and with longer runs. It also wanted a quality, in-gauge hole as the result. The primary challenge was the formation—a hard and abrasive application composed of phyllite, quartz, and mica schist.

Baker Hughes recommended that the operator run its 8½-in. Vulcanix™ geothermal tricone drill bit, which is specifically designed for geothermal applications and high-temperature environments.

The Vulcanix drill bit, which is equipped with a patented, Metal Face Seal system that provides unmatched reliability, longer life, and superior performance, can be run in high-speed applications and in circulating temperatures of up to 400°F (204°C).

The Vulcanix drill bit’s BOSS stabilization design increased bit stability, enabling the bit to drill with fewer vibrations and

enhancing bearing life. Additionally, the bit’s advanced STL™ shirttail and leg hardfacing protected the bit body, ensuring durability that resulted in a good, in-gauge hole.

With the Vulcanix drill bit, the operator drilled 941 ft (287 m) in 75 hours. It achieved an average rate of penetration (ROP) of 12.56 ft/hr (3.8 m/h) with a weight on bit of 4 to 5 tons (3.63 to 4.54 Mg) and 80 revolutions per minute.

Although previous runs with competitor bits showed significant dulling and failed seals, the Vulcanix drill bit and its bearings were in good condition after drilling ended.

This run reduced costs per foot by 20%, resulting in the best run of the section in terms of ROP and total footage drilled.

Because of the Vulcanix drill bit’s success, the operator saved \$20,000 USD in this single run.

## Challenges

- Formation composed of phyllite, quartz, and mica schist
- Geothermal application with a temperature of more than 392° (200°C) with total losses
- Severe dull grading seen on drill bits used in previous runs

## Results

- Drilled 941 ft for 75 hours at an average ROP of 12.56 ft/hr
- Pulled bit out of hole in-gauge and in good dull condition
- Drilled 12% faster and 87% longer when compared with previous runs
- Saved up to \$20,000 USD
- Reduced cost per foot by 20%

Previous runs comparison

