Inflatable POST and DiamondBack Shoe

Ream to Bottom, Isolate Total Loss Zone with Two-Stage Cement Job, Save at Least 40 hrs of Rig Time

Objectives

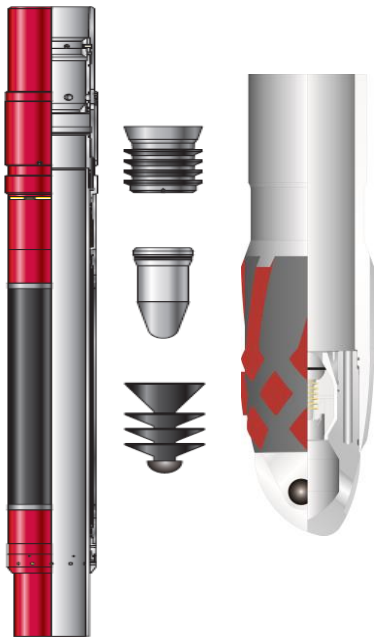
- Ream the casing string to 3,296 ft (1,005 m) and then enable a cement job that isolates lost-circulation zones in a problematic shale formation.

Our Approach

- Weatherford specialists recommended using a DiamondBack casing reamer shoe to ream the casing string to bottom. They also recommended an inflatable pack-off stage tool (POST) set inside the previous casing string to facilitate two-stage. The tool would be dressed with a specialized epoxy compound that increases the torque capability of the pup joint above the tool.
- The Diamondback shoe reamed the 501-ft (153-m) string for 7.75 hours at speeds between 20 and 25 rpm, torque between 2,000 and 4,500 ft-lb (2,712 and 6,101 N·m), flow rates between 200 and 500 gal/min (757 and 1,892 L/min), and a weight on bit of up to 10,000 lbf (44 N).
- The team circulated bottoms up and performed the first stage of cementing without receiving returns at the surface. Then they inflated the packer element in the POST by applying 600 psi (4 MPa) of pressure and initiated the second stage of cementing. The annulus filled with 27 bbl before receiving returns at the surface. After the annulus maintained static fluid levels for 5 minutes, they applied 2,600 psi (18 MPa) of pressure to open the POST. During a second bottoms-up circulation, returns at the surface indicated successful setting.
- The team continued with second-stage cementing and closed the POST by applying 1,400 psi (9.65 MPa) of pressure.

Value to Client

- The DiamondBack reamer shoe enabled the operator to ream the casing to the desired setting depth on the first trip. Pulling the casing and reconditioning the hole would have taken at least an additional 40 hours of rig time.
- The operation provided a single-trip reaming and two-stage cement job.
- The POST helped the operator to achieve the primary cementing goals without nonproductive time (NPT) and eliminated the need to perform an expensive remedial cement job.



The Weatherford POST (left and middle) features an inflatable packer element that creates a barrier to enable second-stage cement to go to the surface even in total losses. The DiamondBack reamer shoe (right) features a diamond-shaped tungsten-carbide cutting structure that provides a 360° cutting radius.

LOCATION
Kingdom of Saudi Arabia

WELL TYPE
Onshore, single-lateral power water injector

HOLE SIZE AND ANGLE
12-1/4 in., vertical

CASING SIZE AND TYPE
9 5/8-in., 40-lb/ft J-55 LTC casing

PRESSURE
1,145-psi (8 MPa) second-stage hydrostatic pressure

SETTING DEPTH
3,296 ft (1,005 m)

PRODUCTS/SERVICES
- Model 781 inflatable POST
- Float collar
- DiamondBack reamer shoe

Weatherford®