PBL® Bypass System Successfully Pumped Gross LCM Multiple Times to Cure Losses, Saving Rig Days

Challenge

An E&P company was drilling a well in the northern Punjab region of Pakistan. While drilling, mud losses were encountered in the 12 ¼- and 8 ½-in. hole sections.

- Drilling through the Murree formation in the 12 ¼-in. hole section, from 1453 to 1471m, heavy dynamic losses of up to 240 bph were observed.
- In the 8 ½-in. section, dynamic losses of up to 200 bph, from 1743 to 2372m, were observed.
- Initially, LCM was pumped through the bit, but losses were not properly cured.

Solution

In the 12 ¼-in. section, the operator added the 8 ½-in. DSI PBL® Bypass System, with extended catcher sub, to the BHA to cure heavy mud losses. For the 8 ½-in. hole section, the operator ran the 6 ¾-in. PBL® Bypass System, with extended catcher sub, to immediately address the anticipated heavy losses.

Execution

While drilling the 12 1/4-in. section, the PBL® Bypass System was activated multiple times to spot gross LCM, while the first LCM pill (180 bbl) was pumped with a concentration of 86 ppb at 1,453m. After pumping, losses were reduced to zero and the PBL® Sub was successfully deactivated.

While drilling ahead, losses resumed at 1471m. The PBL® Bypass System was activated and LCM was pumped with a concentration of 125 ppb but losses were not cured.

Having attempted the third and fourth cycles, a 120 bbl LCM pill with a concentration of 125 ppb was pumped and losses (both static & dynamic) were cured. The well was found in static condition, the PBL® Bypass System was successfully deactivated, and drilling resumed to TD. Mud weight ranged between 1.8 to 1.9 SG.

In the 8 1/2-in. section, losses were observed at different depths, ranging from 70 to 200 bph. A 6 ¾-in. PBL® Bypass System was used throughout the section. Multiple (four to five) cycles were attempted in every run to cure the losses. While pumping LCM, the concentration ranged from 150 to 220 ppb and volumes between 50 and 100 bbl.

Every time the PBL® Bypass System was activated and deactivated successfully, LCM pills were properly pumped out through the ports, curing the losses. Mud weight in this section ranged between 1.3 to 1.5 SG.

The PBL® Bypass System provided multiple benefits:

- Losses were cured with high-concentration LCM pills.
- No additional trips were needed with open-ended DP.
- The section was completed within the stipulated time frame.
- The System was operated multiple times using darts and balls to pump high-concentration LCM.
- No component of the BHA below the PBL® Sub was damaged while pumping LCM pills.
- Calcium carbonate flakes and STOPLOSS were pumped through the PBL® Bypass System.
- The extended catcher facilitated extra cycles with the darts (up to 10 cycles can be done)

Conclusion & Recommendation

Using the DSI PBL® Bypass System in the drilling BHA enabled the operator to handle losses using gross LCM in a timely manner, which ultimately reduced rig time and the cost of expensive drilling fluid.