CHALLENGE
Enable drilling to continue safely by strengthening a loss-prone formation for use of a higher mud weight, and then cement the liner without remedial operations.

SOLUTION
Use Lost Circulation Control Advisor software to design a Losseal Natural Fracture* lost circulation control treatment.

RESULTS
- Controlled the circulation losses and strengthened the formation to enable drilling and cementing without further incidents.
- Saved an estimated USD 57,000 on mud costs by limiting drilling losses and recovering mud from return fluids while cementing.
- Cemented liner with top of cement as designed, saving approximately USD 210,000 for remedial cementing operations.

Natural fractures prompt seven days of lost circulation
An operator was drilling an 8½-in open hole section for a new well in the Kohat-Potwar Plateau of the Upper Indus basin, a harsh and complex environment, when natural fractures began to impede progress. Around 15,800 ft (4,815 m), partial losses began but were managed with conventional mud lost circulation material (LCM).

As the drilling continued, the well experienced a kick, which required an increase in mud weight from 11.0 to 11.4 lbm/galUS [1.32 to 1.36 g/cm³]. This increased the losses, but again they were managed by conventional mud system LCMs, including calcium carbonate and mica pills in multiple particle sizes.

Near 16,500 ft (5,000 m), the well experienced total losses—amounting to more than 2,000 bbl [318 m³] over 7 days. Conventional LCMs were added to reduce the mud weight and stabilize the hole, but drilling could not continue safely with the reduced mud weight, and increasing it would immediately resume the losses.

The operator asked Schlumberger for a way to strengthen the formation and plug the naturally fractured formation enough to resume drilling.

Expert software recommends composite pill
Schlumberger engineers turned to the Lost Circulation Control Advisor software, an expert decision-tree application used to analyze and solve lost circulation problems. Based on inputs of well fluid information, prior lost circulation treatments, loss rates, and other well data, the software recommends options to mitigate lost circulation.

For this well, the software recommended a Losseal Natural Fracture treatment using a fit-for-purpose pill comprising a composite blend of fibers and solids that create a strong impermeable grid, stopping mud or cement from flowing into natural fractured zones.

One pill controls the losses without pulling the BHA
Schlumberger engineers designed the new pill and delivered it to the wellsite in less than a day. The Losseal Natural Fracture treatment was pumped successfully through the circulating valve. When the treatment reached the formation, it was squeezed with approximately 980 psi [6.8 MPa] of pressure, demonstrating that the losses were controlled with a single pill.

After increasing the mud weight, the crew drilled the final 800 ft (244 m) of wellbore, and then the 7¾-in liner was run in and cemented without further incident. In all, the customer saved an estimated USD 57,000 by limiting mud losses and recovering mud from return fluids, and approximately USD 210,000 by eliminating the need for remedial cementing.