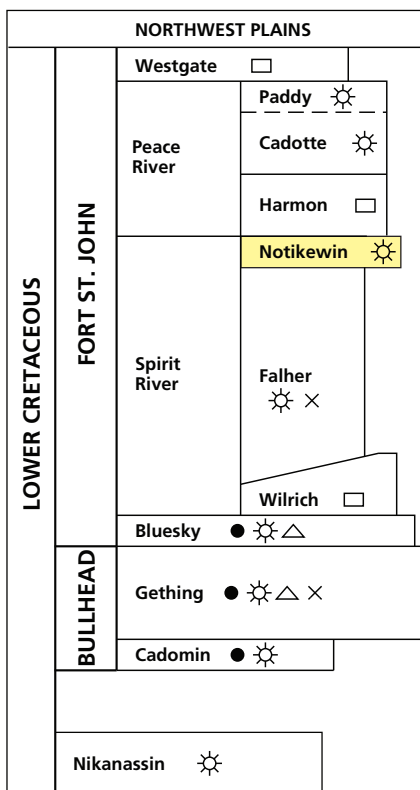


Packers Plus® Case Study



Flexibility of Packers Plus technology provides a customized solution for tight gas well in Western Canada



resources because advances in horizontal drilling and multi-stage completion technology have allowed for recovery of previously uneconomic reserves. For example, operators working in west-central Alberta are starting to successfully exploit a number of Cretaceous tight gas sandstone formations, including the Cardium, Cadomin, Nikanassin, Bluesky and Notikewin.

The Challenge

An operator targeting the Notikewin member of the Spirit River formation planned to complete their horizontal well open hole with a Packers Plus StackFRAC® multi-stage fracturing system. They chose Packers Plus for their operational experience — having run over 4,000 systems — and the reliability and repeatability of the tools resulting from stringent QA/QC procedures. However, due to sloughing of the well at the heel after drilling of the lateral the operator had to case and cement the horizontal and reassess how to proceed with stimulation of the well.

The Solution

Despite having the option to “plug and perf” the cemented lateral, the operator chose to reconfigure the StackFRAC system to run into the 4 ½” intermediate casing and target fractures at seven perforation clusters. A slim-hole liner was designed with 4 ½” x 2 ⅞”

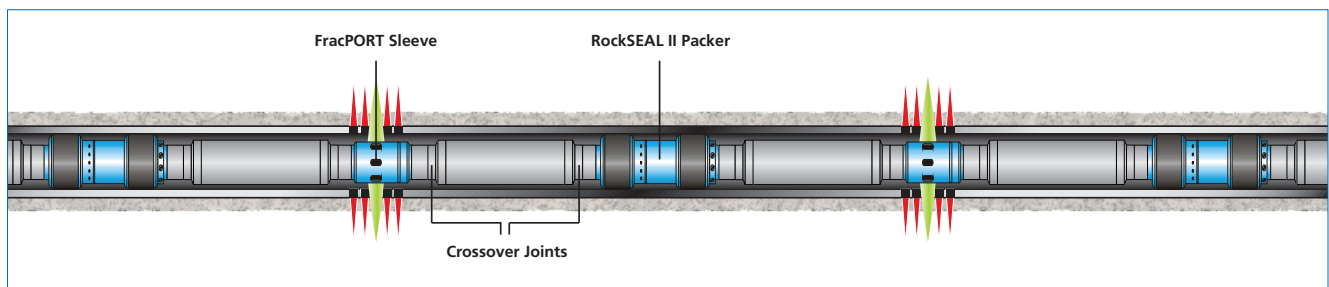
RockSEAL® II packers and 2 ⅞” FracPORT™ sleeves. To maximize the flow area, 3 ½” pup joints were swedged in between the tools using flush joint crossovers.

Also, because the StackFRAC Liner Hanger Packer was set in the 7” vertical casing, but the first RockSEAL II packer was set in the 4 ½” intermediate casing, the liner was also swedged from 4 ½” to 3 ½” pup joints and then to 2 ⅞” just before the RockSEAL II packer.

The Results

The swedging resulted in an effective liner size of 3 ½” which was successfully snubbed into the 4 ½” intermediate casing to a total depth of 4,100 m. An average of 40 tonnes of proppant was pumped into each stage at 2.5 – 3 m³/min (34 mPa) in seven hours — one hour per stage. The continuous pumping operation of the StackFRAC system minimized operational time and frac fluid volumes, reducing costs.

Packers Plus sales and technical services personnel worked closely with the operator to revise the program to ensure their needs were met and that the job went off as planned. The operator was so pleased with the job that they are now running 18-stage StackFRAC HD™ systems in their Pembina-Cardium wells.



Cased hole StackFRAC.

Some or all of the systems, methods or products discussed herein may be covered by one or more patents, or patents pending, including US patent numbers 6,907,936; 7,134,505; 7,108,067; 7,543,634; 7,431,091; 7,021,384; 7,353,878. Copyright © 2010 Packers Plus Energy Services Inc. All rights reserved. CAN-11-AUG-10



www.packersplus.com