

# High Pressure Annular Coiled Tubing Fracturing

Montney and Cardium Formations, Western Canadian Sedimentary Basin

## HISTORY

Formations in the Western Canadian Sedimentary Basin are continuously being completed in the pursuit of optimizing sand placement during hydraulic fracturing operations. Typical fracturing techniques in the Montney and Cardium area have included placing proppant into clusters between zones, which does not homogeneously distribute stimulation fluid between the multiple perforation intervals.

## CHALLENGE

Unconventional siltstone and shale reservoirs have proven challenging to effectively place a fracturing treatment due to the high pressure and low permeability characteristics. The ideal fracturing placement involves consistently placing sand as follows:

- Maximizing stimulated reservoir volume into each zone
- Optimizing reservoir contact and areal drainage
- Maximizing flowback of base fluid pumped into reservoir
- Sustain production of hydrocarbon recovery

SOLUTION	RESULTS
<p>Calfrac has specifically designed surface equipment and operating procedures to complete a +6,000m annular fracturing operation beyond the previously defined 10,000 psi pressure limitation.</p> <ul style="list-style-type: none"> <li>• Abrasively perforated each zone into the blank casing</li> <li>• Single pinpoint entry into the reservoir</li> <li>• Confidence in location of sand and fluid placement</li> <li>• Specifically designed coiled tubing strings for high rate and high pressure</li> <li>• Calfrac CWS-600 Slickwater fluid system to effectively place conductive path</li> </ul>	<p>Calfrac completed the first true 15,000 psi annular Slickwater coiled tubing fracturing operation:</p> <ul style="list-style-type: none"> <li>• Completed 25 stages throughout the lateral section</li> <li>• Treated at an average pressure of 75 MPa and 4.5m<sup>3</sup>/min</li> <li>• Successfully placed up to 350 kg/m<sup>3</sup> of sand concentration and 60T per zone</li> <li>• Hydrocarbon was propitiously produced back to surface after six (6) days of flowing</li> <li>• Elevated water recovery and producing surface pressure as compared to alternate completion methods</li> </ul>

## Annular Coiled Tubing Fracturing Assembly

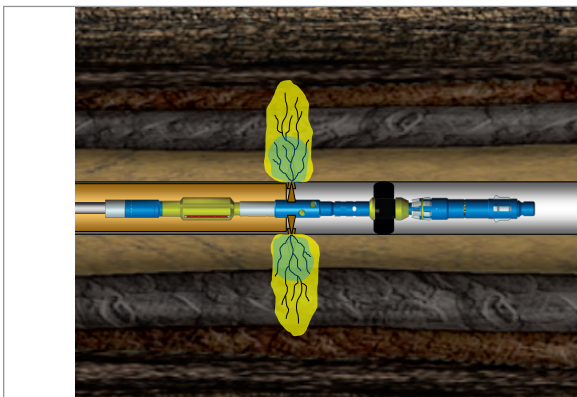


Illustration Provided by: NCS Multistage

