

## BRITISH COLUMBIA, CANADA

HORN RIVER

|                            |                      |
|----------------------------|----------------------|
| <b>Lithology</b>           | Shale                |
| <b>Reservoir</b>           | Otter Park           |
| <b>Temperature</b>         | 266 degF [130 degC]  |
| <b>Pressure</b>            | 4,714 psi [32.5 MPa] |
| <b>Max. drilling depth</b> | 16,440 ft [5,011 m]  |
| <b>Completion size</b>     | 5.5 in [139.7 mm]    |
| <b>CT string size</b>      | 2.375 in [60.3 mm]   |

**Background**

An operator in Horn River needed to mill out Copperhead\* drillable bridge and flow-through frac plugs to bring eight wells onto production after a horizontal plug-and-perf completion. A combination of techniques were used to mill plugs quickly and efficiently, including producing the well prior to milling; mill by differential pressure rather than weight on bit; limit the use of vibration tools to lower plugs only; monitor return fluid viscosity to determine proper gel loading and ensure solids carrying efficiency. There was no damage to the CT string and no time lost.

**Technologies**

- Copperhead drillable bridge and flow-through frac plug
- D2 TT Turbomill\* thru-tubing turbomill

## 102 Plugs Successfully Milled Using CT in 31 Days During 8-Well Milling Operation

Combination of techniques helped run 417,000 ft [127,000 m] of 2.375-in CT on schedule with zero string damage and no time lost



*The Copperhead plugs were milled out of eight wells with an average milling time of 40.7 min per plug and with zero damage to the CT.*