HISTORY
An international operator working in Northeast B.C. was performing horizontal, multi-stage plug & perf completions on multiple well pads. The target zone was the Montney formation (80°C BHT) which requires the use of 6-10 m³ of 15% HCl Acid to be pumped down the casing prior to each fracturing stage to help initiate breakdown.

PROPOSAL
Use 33% HCR 2000 in place of conventional 15% HCL acid for spearheads. Multiple samples of the fracturing fluid (recycled frac fluid w/ TDS up to 200,000ppm) were tested for compatibility with Enviro-Syn® HCR 2000 blend. As no precipitates were observed when the fluids were mixed, the water was proposed to be used as the diluent for the HCR spearheads.

OPERATIONS
60 m³ of concentrated Enviro-Syn® HCR was delivered to location in 2 truckloads and stored in a single acid tank within the water tank farm. HCR was then mixed on the fly (slip streamed) with the fracturing fluid down to ±33% concentration and pumped as a spearhead. The one tank of HCR once diluted was able to supply 180 m³ worth of spearhead fluid for the pad.

RESULTS
With more than 300 stages in 30+ wells, the client has been able to realize significant reductions in their costs and HSE exposure, all while seeing the same or better performance as traditional 15% HCL acid.

VALUE ADD
- Reduced trucking
  - 1/3 the acid trucks required to delivery product to location
  - Less trucks on the road reducing traffic and public concern.
- HCR-2000 can be mixed on the fly with frac water (produced water >150,000ppm TDS).
  - Concentration can be adjusted if tough breakdowns are encountered
- Inherently low corrosion rates
  - Reduced corrosion issues with wellbore tubulars should job problems arise
  - < 0.02lbs/ft² @ 90°C for 24hrs
- No secondary containment

HSE EXPOSURE
- Non-irritant to skin
  - Decreased personnel exposure when loading, unloading & pumping
- Non-fuming
- Readily Biodegradable
- Non Toxic

The operator is looking to continue with the use of the HCR for their spearhead needs on the long term development of their properties.