

## Quick and Efficient Mobilization Leads to Successful Multistage Fracturing Operation



Trican's first job using the dry polymer hydrated friction reducer achieved a high performance efficiency rate and reduced costs.

### Business Needs

A successful fracturing job requires adequate planning and organization. This job took place at a remote location in the Marcellus shale play in Pennsylvania, where equipment had to be transported great distances to site. Employees had to be hired or relocated, and the job had to be completed within a specific time period. Additionally, the customer wanted to reduce the amount of additives needing to be transported to site and pumped down the well.

The remote location presented one kind of challenge, and the difficult well conditions presented another. The low permeability shale gas wells (approximately 0.001 mD) were situated at an average depth of 1,200 to 2,400 metres (4,000 to 8,000 ft). The average well temperature varied between 38°C and 66°C (100°F and 150°F).

### Trican Solution

Trican transported all the required equipment from western Canada across the US continent. Trican set up an operations base and hired a staff of 75 people. Because of the meticulous planning involved, the first fracture treatment was performed within three months of the contract being awarded.

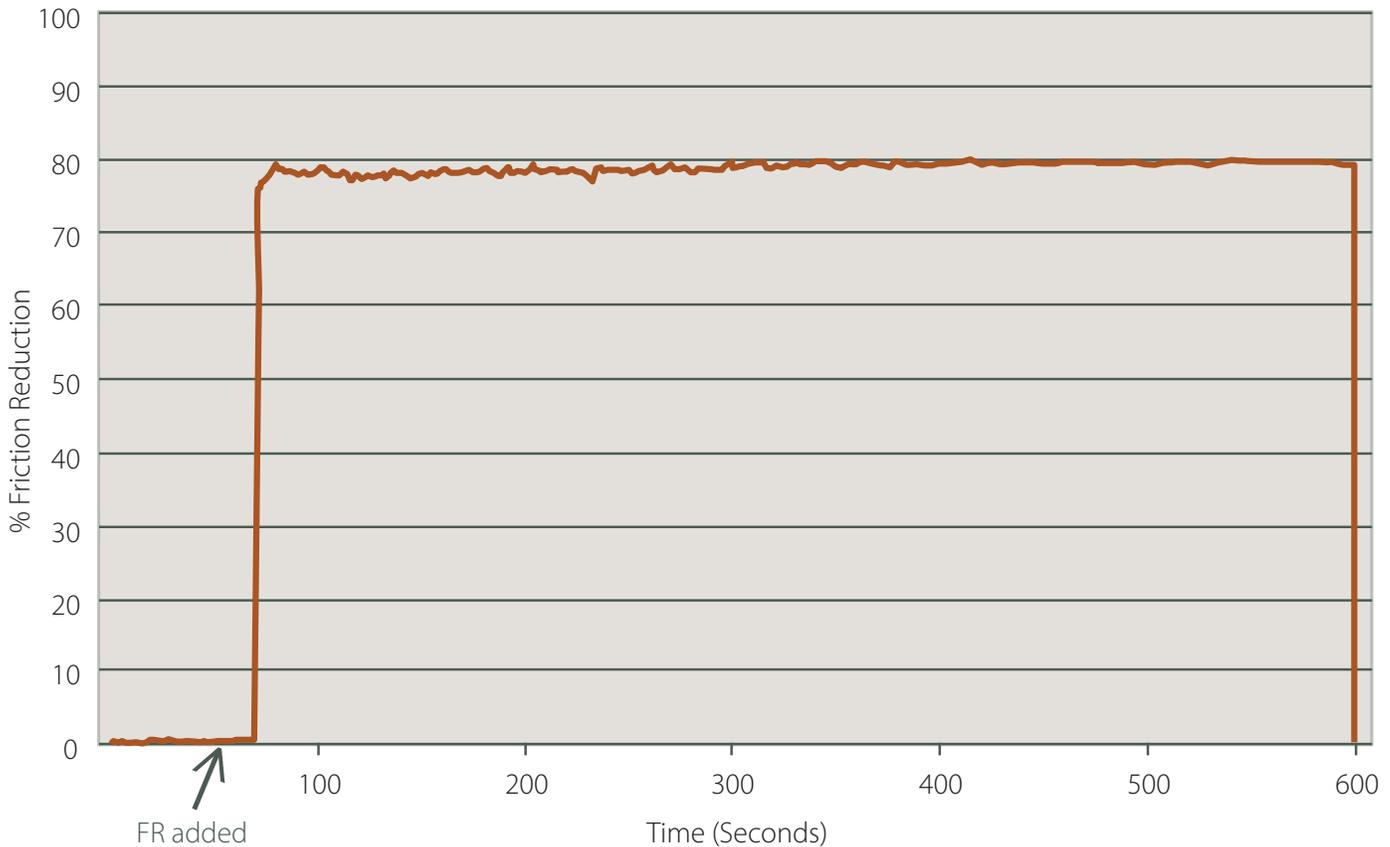
To address the customer's requirement for a reduced volume of additives, Trican used a dry polymer friction reducer to increase the efficiency of hydration during fracturing operations. The polymer used was the friction reducer GFR-1D. In typical Marcellus source waters, liquid-based friction reducers normally achieve a 75% efficiency rate when pumped on-the-fly. Using the custom hydration unit to add GFR-1D guarantees 100% polymer hydration and optimal efficiency during the job. By increasing the efficiency, we are able to use less product, save time, and reduce logistical requirements.

To fulfill the demands of the large operation, 15 to 18 frac pumpers, with a combined power output of 45,000 HHP, were used. Total fluid pump rate was 13 to 18 m<sup>3</sup>/min (80 to 113 bpm), with 15 to 20 stages per well (90 to 120 wells). There were 15 to 20 slick water stages per well, of approximately 150 to 250 tonnes (330,000 to 550,000 lb) each.

### The Trican Advantage

This multi-stage fracturing operation in the Marcellus shale formation was Trican's first job using the dry polymer friction reducer. To the customer's satisfaction, the friction reducer increased stage efficiency and reduced costs. Trican also achieved a high performance efficiency rate, accomplishing six stages in a 16-hour period, while conducting equipment maintenance during alternating shifts. While the customer's target was two frac treatments per day, Trican accomplished four to six well pad "zipper fracs". This technique involves alternating treatments between wells whose wellheads are located on the same pad. While the crew is using one well, the perforating crew sets the plug and perforates the other well.

## Effectiveness of pre-hydrated solid GFR-1D:



## Case Study Snapshot

**Date:** 2010-2012

**Customer:** International energy company

**Location:** Marcellus Shale,  
Pennsylvania, USA

### Challenges:

- Successfully managing the logistics involved with transporting a fleet from western Canada to eastern USA
- Establishing a new base and crew
- Completing a large fracturing job in difficult conditions
- Reducing the amount of additives transported to location and pumped down the well

### Trican Innovation:

- Trican's first job using a dry polymer friction reducer. This allowed for an increased hydration efficiency rate

### Results:

- First fracture treatment was performed within three months of the contract being awarded
- Achieved up to five stages a day with up to 1,000 tonnes (2,200,000 lb) per day
- Increased effectiveness of the friction reducer, which reduced the amount of additives



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