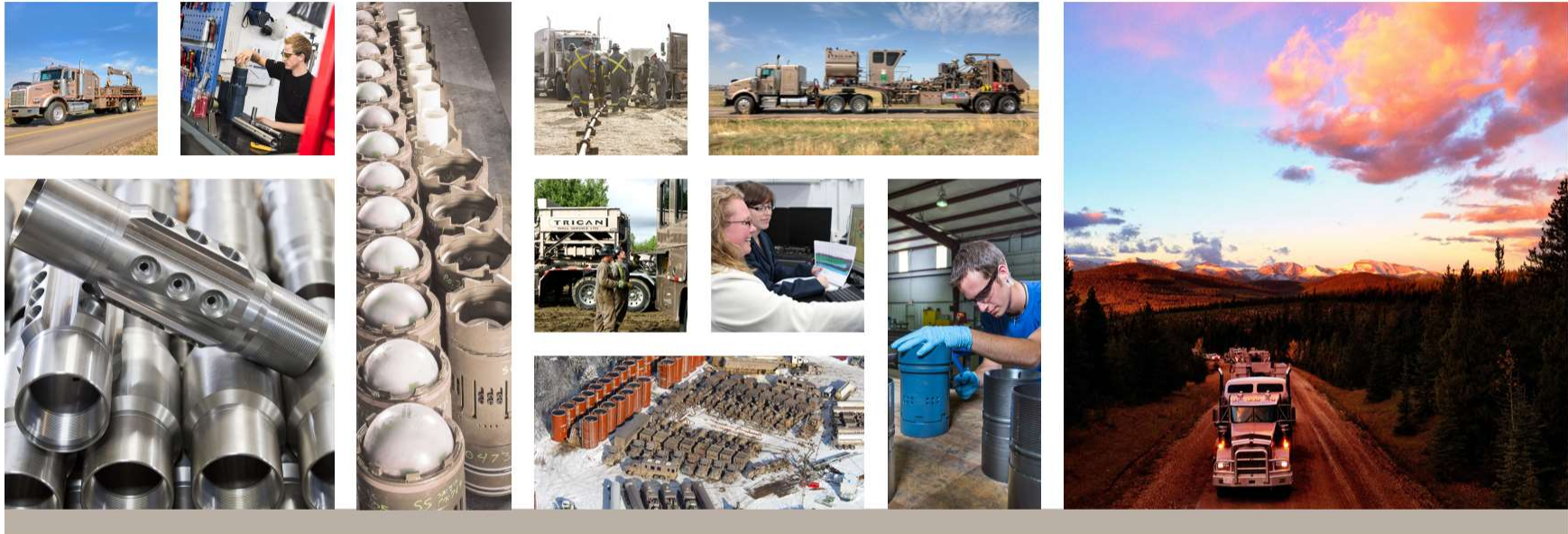


WORLDWIDE KNOWLEDGE – LOCAL SOLUTIONS™



## A Novel Method For Transporting Sand

Scott Churchill, P.Eng

September 8<sup>th</sup>, 2016

2900, 645 – 7th Avenue SW | Calgary | AB | T2P 4G8 | 403.266.0202 | [www.trican.ca](http://www.trican.ca)

1

## Proppant Transport Modifier (PTM)



- Improved Proppant Transport
- Operational Benefits



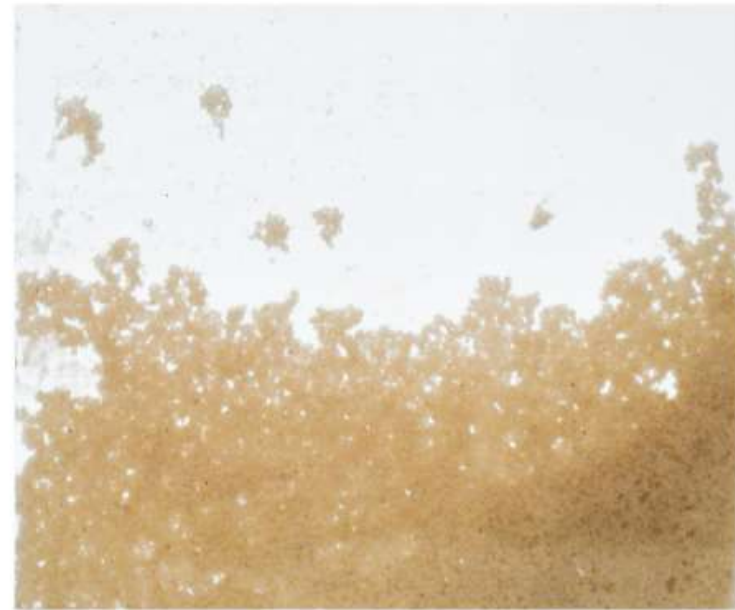
- Upgrade Proppant Crush Resistance
- Production Enhancement

## Improved Proppant Transport



Conventional slick water - settled 40/70 sand 300 kg/m<sup>3</sup> (2.5 ppg)

Hydrophobic & Gasphilic  
Better Carrying Capabilities



MVP Frac slick water - settled 40/70 sand 300 kg/m<sup>3</sup> (2.5 ppg)

Fluidization of Proppant  
Increased Bed Height

## Production Enhancement

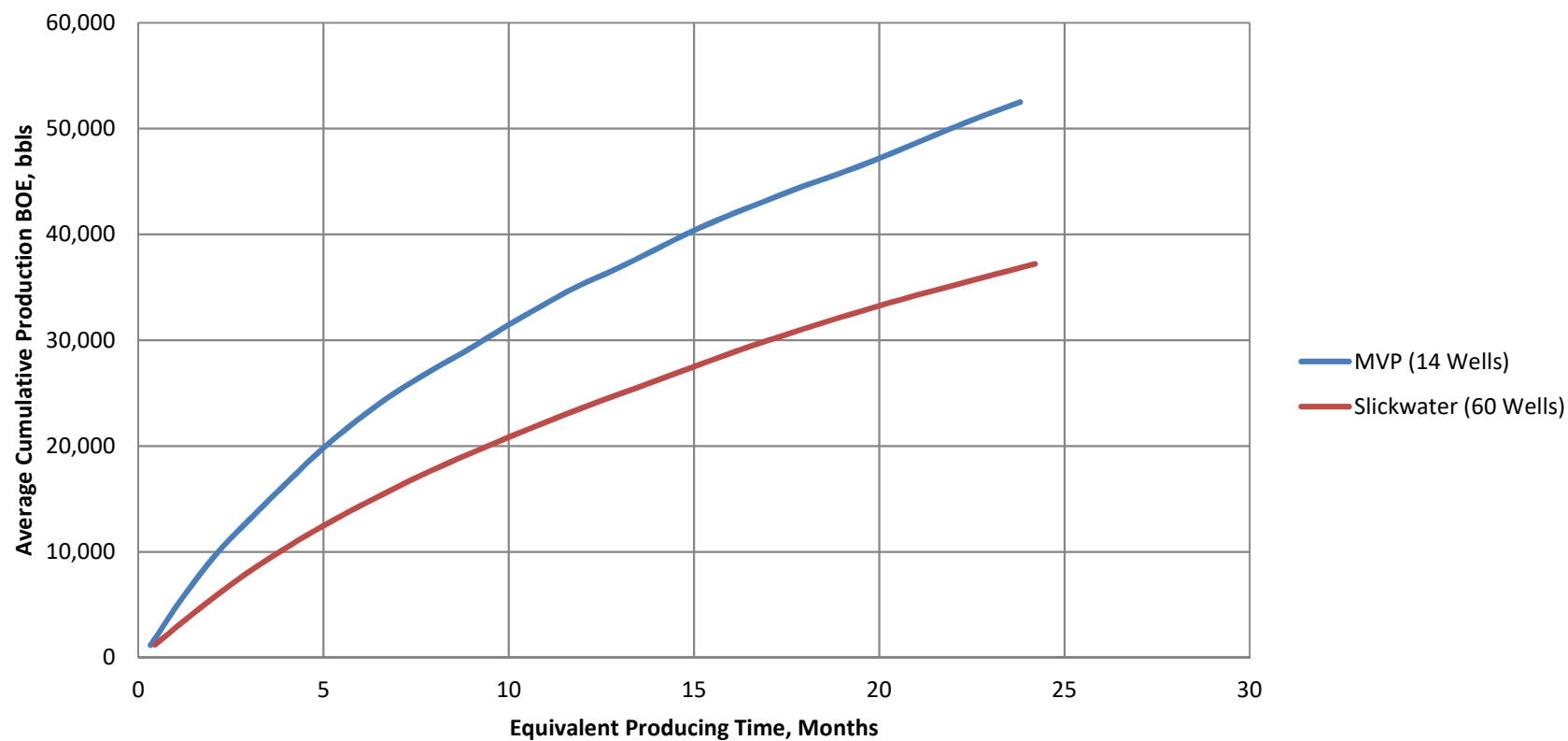


- More proppant further and deeper into the frac network
- Increased proppant bed height
- Increased regain conductivity
- Increased maximum sand concentration and proppant pack width

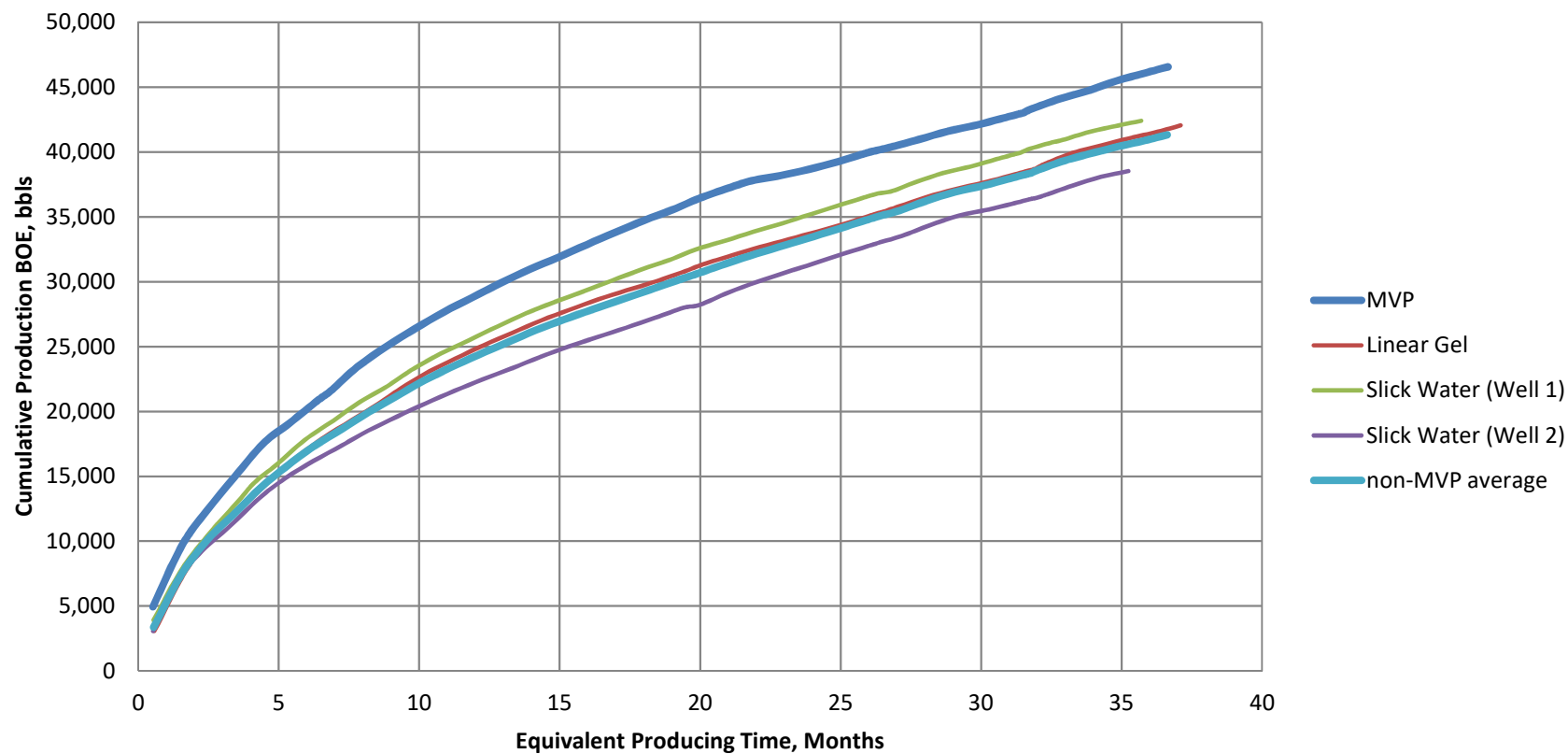




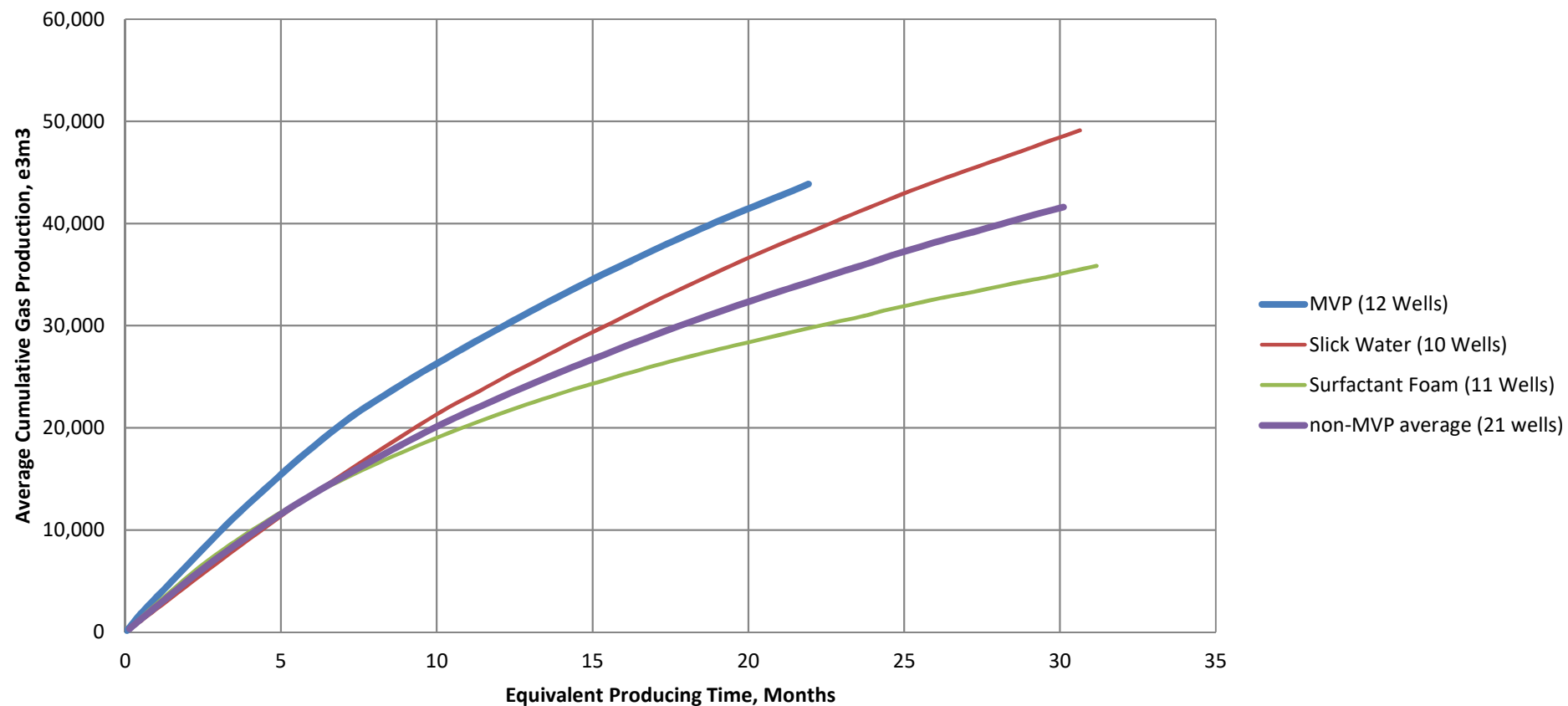
## Production Enhancement – Tight Oil Case Study



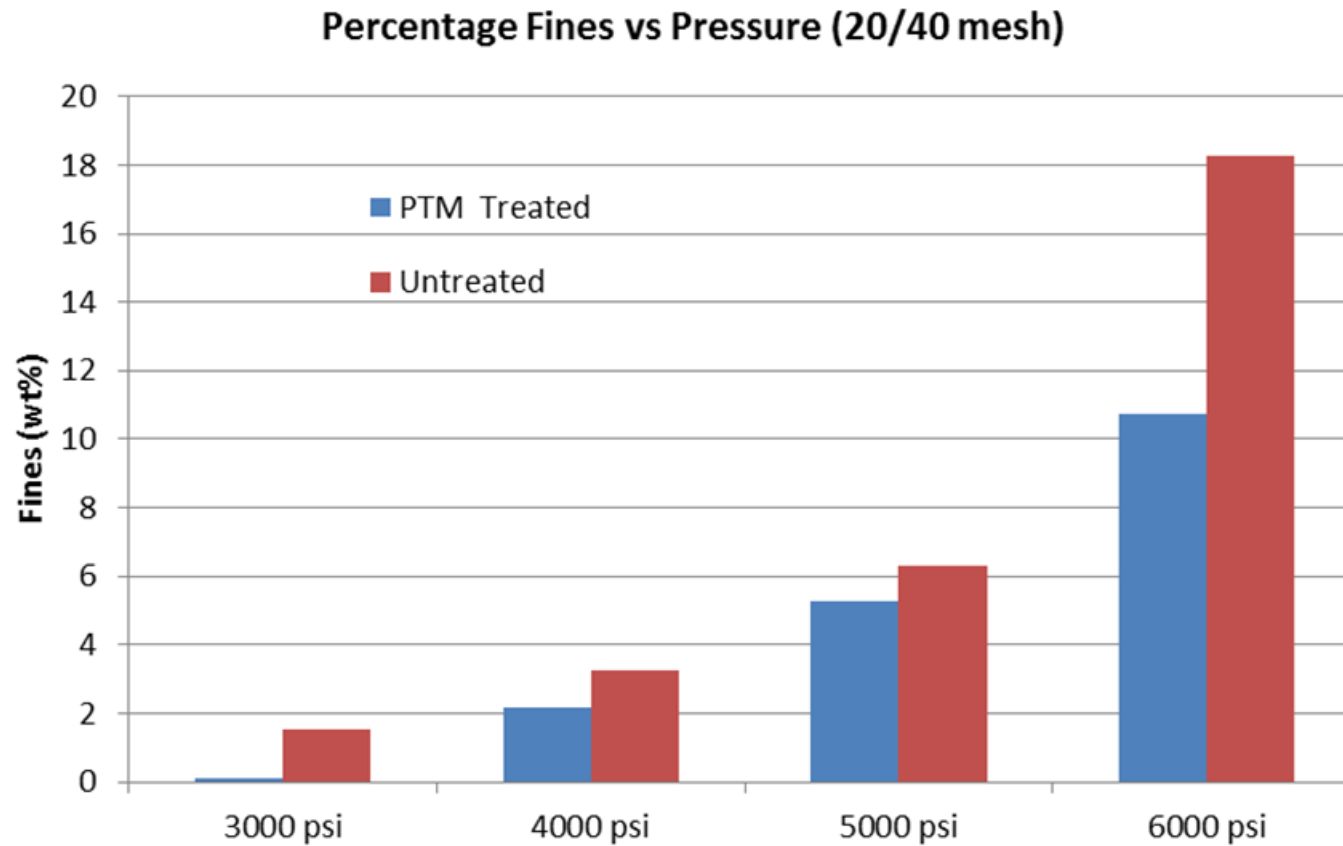
## Production Enhancement – Oil & Gas Pad Case Study



## Production Enhancement – Tight Dry Gas Case Study

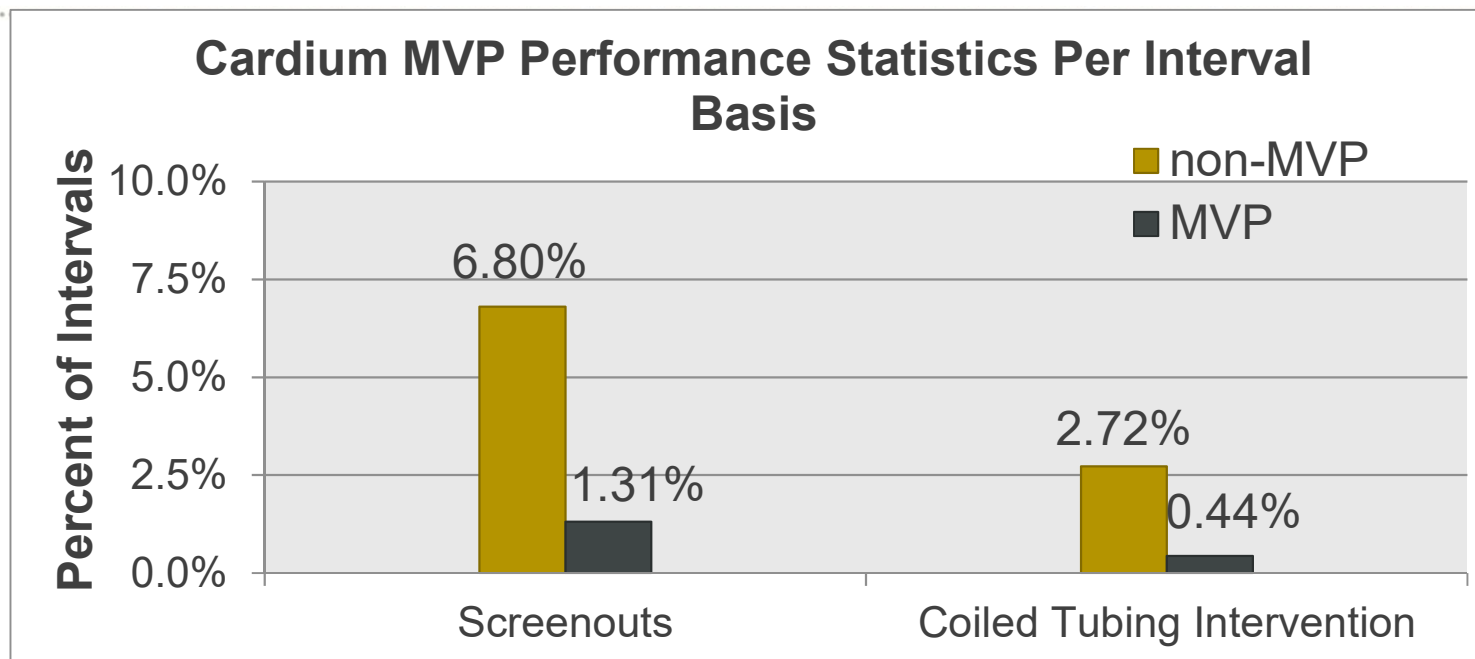


## Upgrade Proppant Crush Resistance





## Operational Benefits



- Fewer screen outs
- Fewer coil tubing interventions required (saving time and \$\$)
- Higher concentrations = less water
- Less horsepower required to place proppant

### Proppant & Confidence Booster!

- Lower rates on slick water fracs
- Add to clean out fluid with small diameter coil where cleanout velocity might be an issue



## Under Pressure



## PTM – Trican Pumping History



Rock Type	Number of Wells	Number of Stages
Tight Limestone	5	66
Limestone & Dolomite	2	16
Carbonate	2	18
Sandstone	334	5813
Tight Sandstone	46	477
Tight Sandstone & Shale	24	263
Shale	9	139
Siltstone & Shale	13	153
Tight Siltstone	80	1373
<b>Total</b>	<b>515</b>	<b>8318</b>

## PTM – Trican Pumping History



Produced Fluid	Number of Wells	Number of Stages
Gas & Oil	333	5829
Gas & Liquids Rich Gas	145	2157
Oil	23	188
Gas	4	37
Gas, Liquids Rich Gas, & Oil	6	78
Liquids Rich Gas & Light Oil	4	29
<b>Total</b>	<b>515</b>	<b>8318</b>

## Proppant Transport Modifier



- Improved Proppant Transport
- Increased Production
- Operational Benefits
- Upgrade Crush Resistance
- Can be pumped with or without gas





