WaterLess Fracturing Technology

"Making the Most from the Reservoir"

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Agenda

- GasFrac Overview
- Conventional Fracturing
- LPG Fracturing
- Process Overview
- Summary and Reducing Impact

GASFRAC Overview

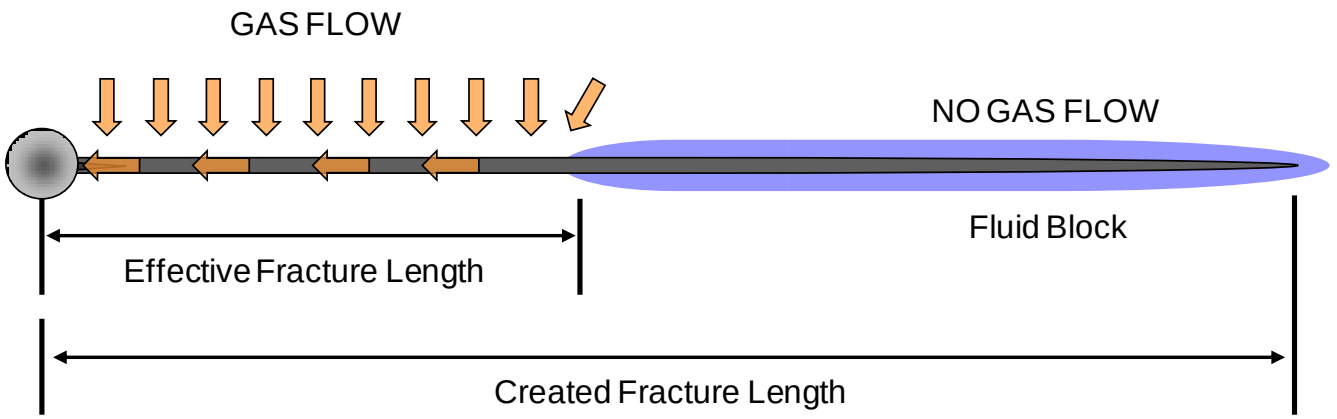
- GASFRAC is a fracture stimulation company which has developed new technology eliminating the use of water and utilizing LPG(propane/butane) to fracture stimulate oil and gas wells.
- GASFRAC's technology is a proprietary, patent pending fracturing process
- LPG fracturing delivers a lower cost per useful fracture length than conventional water based stimulations
- LPG fracturing delivers enhanced well productivity to generates higher project ROR's, ROI's, and NPV's.
- Over 700 fracturing treatments have proven the technical and economic benefits of LPG fracturing (41,000,000 lbs of proppant pumped to date)
- Eliminates potable water usage compared to conventional water based fluids.

Conventional Fracturing

- Hydraulic fracturing is used to increase the production rate from wells.
- Production increases are accomplished by the created fractures providing an efficient path for oil or gas to move to the wellbore.
- Fluids containing propping agents are pumped at high pressures in order to crack the reservoir rock and move the proppant particles into the fractures.
- At the end of pumping the fractures are held open by the proppant.
- The well is opened to recover the fracturing fluid and begin production.
- The most commonly used base fluid for fracturing is water.

Conventional Fracturing

- **In most reservoirs the fracturing fluids cause problems that will impair flow.**
  - Water based fluids will react with the minerals and salts in the rock.
  - Water will become trapped within the pores of the rock.
  - Water will interact with the gas, oil or water native to the formation.



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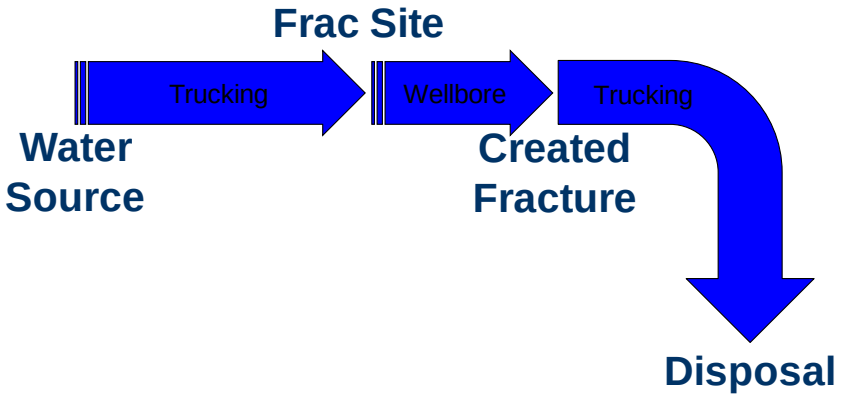
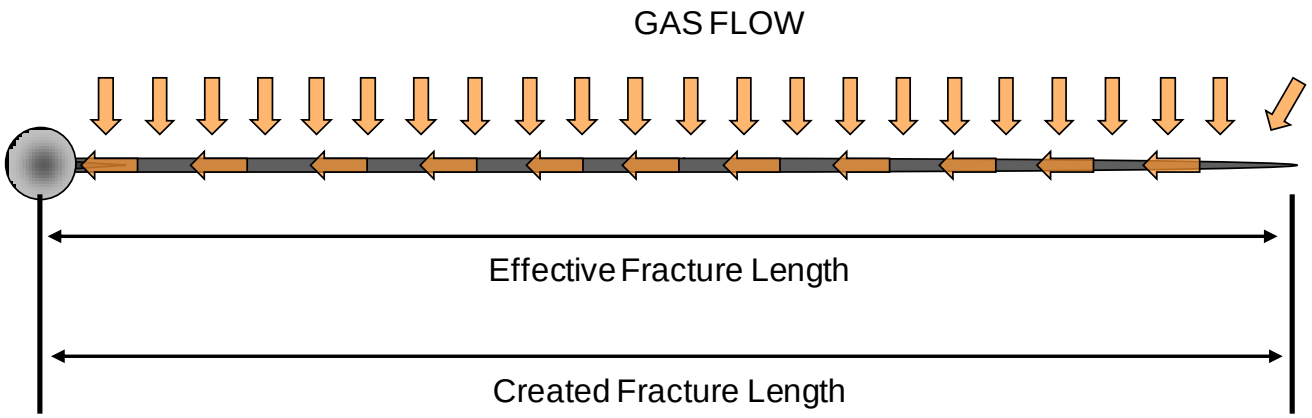
Conventional Fracturing

- **Environmental impact of water based frac fluids can be significant.**
  - Large quantities of water are often needed for hydraulic fracturing (shale gas on average uses 3-5,000,000 Million gallons per well).
  - Fluids trapped in the formation are difficult to remove < 50% recovered.
  - Cleaning up the well after the fracture job often requires opening the well to atmosphere – flaring.
  - Recovered water contains oils, minerals, salts from the reservoir.
  - Chemicals often need to be removed to recycle the frac water.
  - Water that cannot be recycled is usually injected underground for disposal.



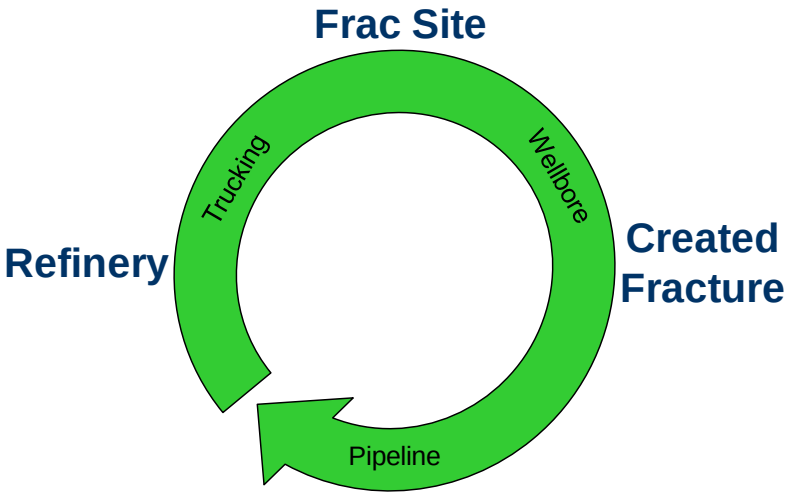
LPG Fracturing

- **LPG creates fractures and delivers proppant exactly like water.**
  - Generates propped fractures as effectively as conventional water based fluids.
  - Requires less pumping equipment on location compared to water frac jobs
- **LPG is naturally occurring in the reservoir and completely formation compatible.**
  - LPG does NOT react with the minerals and salts in the rock.
  - LPG does NOT become trapped within the pores of the rock.
  - LPG will mix with the gas and oil to improve recovery from the formation.
  - More effective fracture length to improve efficiency from the fracturing process.



LPG Fracturing

- **Environmental impact of LPG based frac fluids can be minimal.**
  - Quantities of LPG needed for hydraulic fracturing can be lower.
  - LPG is NOT trapped in the formation
  - ~100% of all LPG pumped is recovered
  - No biocides are required or pumped into the formation
  - No reservoir minerals, nuclides, or salts are recovered with the LPG
  - LPG is recovered with the natural gas to the pipeline and recovered by gas processing where it can be recycled for fracturing or sale.



LPG Pumping - Process Overview

- LPG Fracturing successfully completed 700+ treatments
  - Deepest treatment to 12,150 ft
  - Largest job - 1,000,000 lbs on a 10 stage horizontal well
  - Highest pressure treatment to 13,200 psi
  - Treatments placed into over 40 different reservoirs
  - Maximum injection rate 60 bpm

- Frac treatments competed for over 50 clients including EnCana, Husky, EOG, Devon, Canadian Natural Resources, Nexen, Duvernay, Paramount, Compton, EXCO, Union Gas Operating, RC Energy and SandRidge
- LPG fracturing has demonstrated significant benefit in well performance relative to conventional well fracturing

LPG Fracturing -Process Overview

- **The GASFRAC LPG Fracturing process and procedure are based upon an independent hazard and operability study completed by a professional risk management company**
  - The relevant recommendations are incorporated into the equipment design and operating procedures to mitigate and eliminate potential risks.
  - The GASFRAC specialized equipment and operating procedures meet or exceed all industry standards for handling of propane – IRP Volume 8-2002 and NFPA 58
  - GASFRAC's equipment is Canada Transport and U.S. D.O.T. compliant.
  - Completely enclosed, pressured systems are applied for LPG storage, proppant addition, pumping and handling throughout the fracturing process.
  - Nitrogen, an inert gas, is utilized throughout the process to maintain pressure control on all vessels.
  - GASFRAC employs highly experienced and rigorously trained personnel.

- **The GASFRAC process is approved by the energy boards of Alberta, BC and Saskatchewan, and work has been performed in Pennsylvania, and Texas.**

Frac Fluids Comparison Summary

	Water	Frac Oil	CO_2	N_2	LPG
Fracture Creation	✓	✓	✓	✓	✓
Proppant Transport	✓	✓	?	✗	✓
Reservoir Compatibility	✗	✗	✓	✓	✓
Load Fluid Recovery	✗	✗	✓	✓	✓
Fluid Recycling	?	✓	✗	✗	✓
Recover to Pipeline	✗	✗	✗	✗	✓
Fluid Availability	✓/?	?	✗	✗	✓

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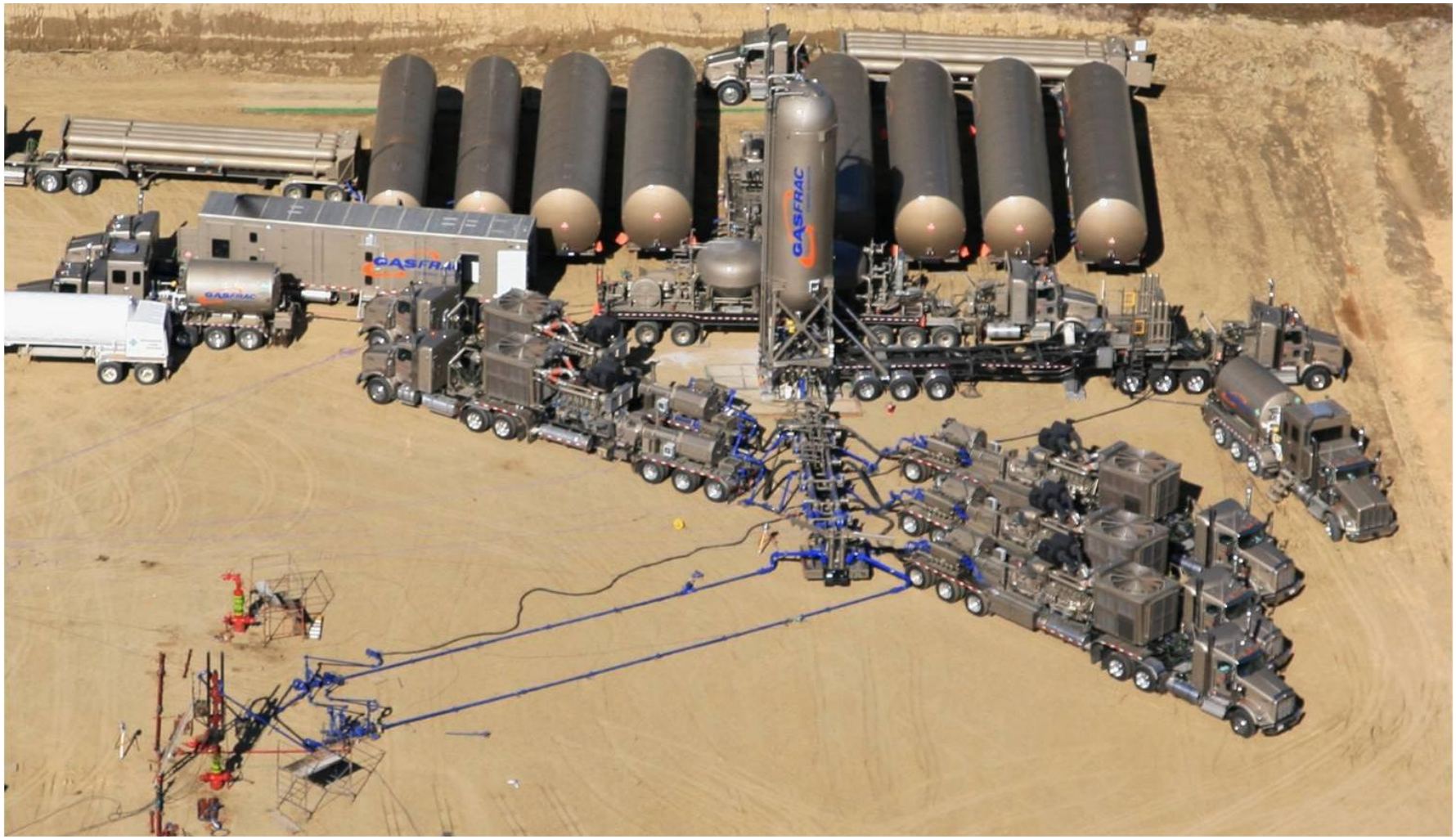
LPG Fracturing -Reducing Impact

- **Eliminate potable water use in hydraulic fracturing**
  - No water consumption, no disposal
  - No biocides are used or required
- **Reduce or eliminate flaring**
  - No formation gas burned, no CO_2 generated
- **Reduce trucking activities**
  - Fewer loads due to lower weight fluid
  - No disposal trucking (when LPG is recovered to pipeline)
- **More effective fracture treatments**
  - Improved production, smaller treatments, fewer wells

LPG Fracturing - a Superior Alternative.



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LPG Fracturing - a Superior Alternative.

- Wapiti, Cardium Formation in the WCSB

Well	Loc.	Fluid Type	Proppant	Stages	IP BOE/D
1	1-9	CO2 – Frac Oil	495,000	15	133
2	4-17	Frac Oil	484,000	11	260
3	4-22	CO2 – Frac Oil	495,000	15	215
4	12-14	CO2 – Frac Oil	704,000	16	280
5	14-28	**LPG**	333,000	10	1,138

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