

# Sampling and Testing

FTeX™

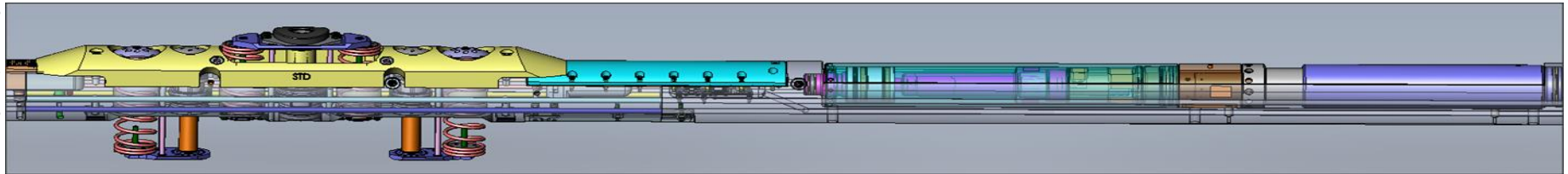
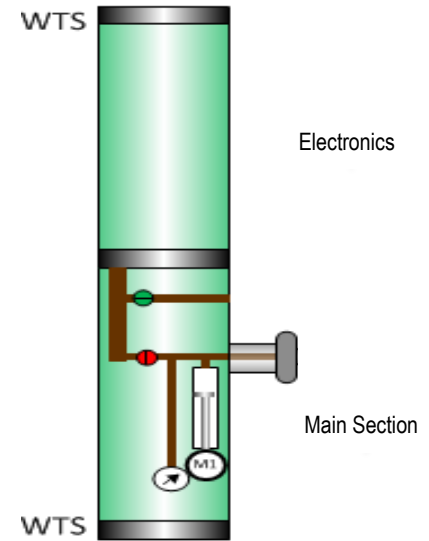


# FTeX™ Service

- Automated testing
- Efficient deployment
- Accurate measurements
- Latest technology
- All digital design

# FTeX™ - Specifications

- Temperature rating: 350 °F
- Pressure rating: 30,000 psi
- Tool OD: 3 7/8"
- Hole sizes: 4.75 – 16 inches, or optimized to hole size.
- Gauge located inches to packer
- High precision electrical pump



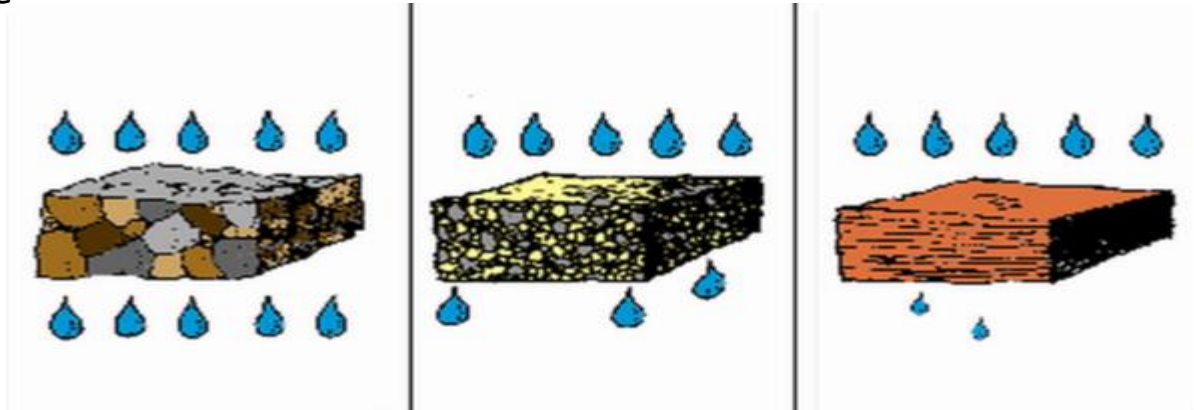
# FTeX™ – Flexibility

## ■ Combinability

- All open hole tools (eg. MReX and 3DeX)
- Reduce rig time, no additional run for FT
  - Reduces string size for sampling
  - Perfect combination for RCX Sentinel Services
- Allows customer to make decisions earlier
  - Where/If to sample

## ■ Mobility Range

- **0.1 mD/cp and up**



# FTeX™ – The Smart Stuff

User  
Selects  
Expected  
Formation  
Type

Initiates  
the Start  
of the Test



Pressure Response is  
analyzed and Adjusted  
Stability is Reached

Mobility is Analyzed  
Fm Pressure is analyzed

Test Characteristics are  
altered.  
Pressure Response is  
analyzed and Adjusted  
Stability is Reached

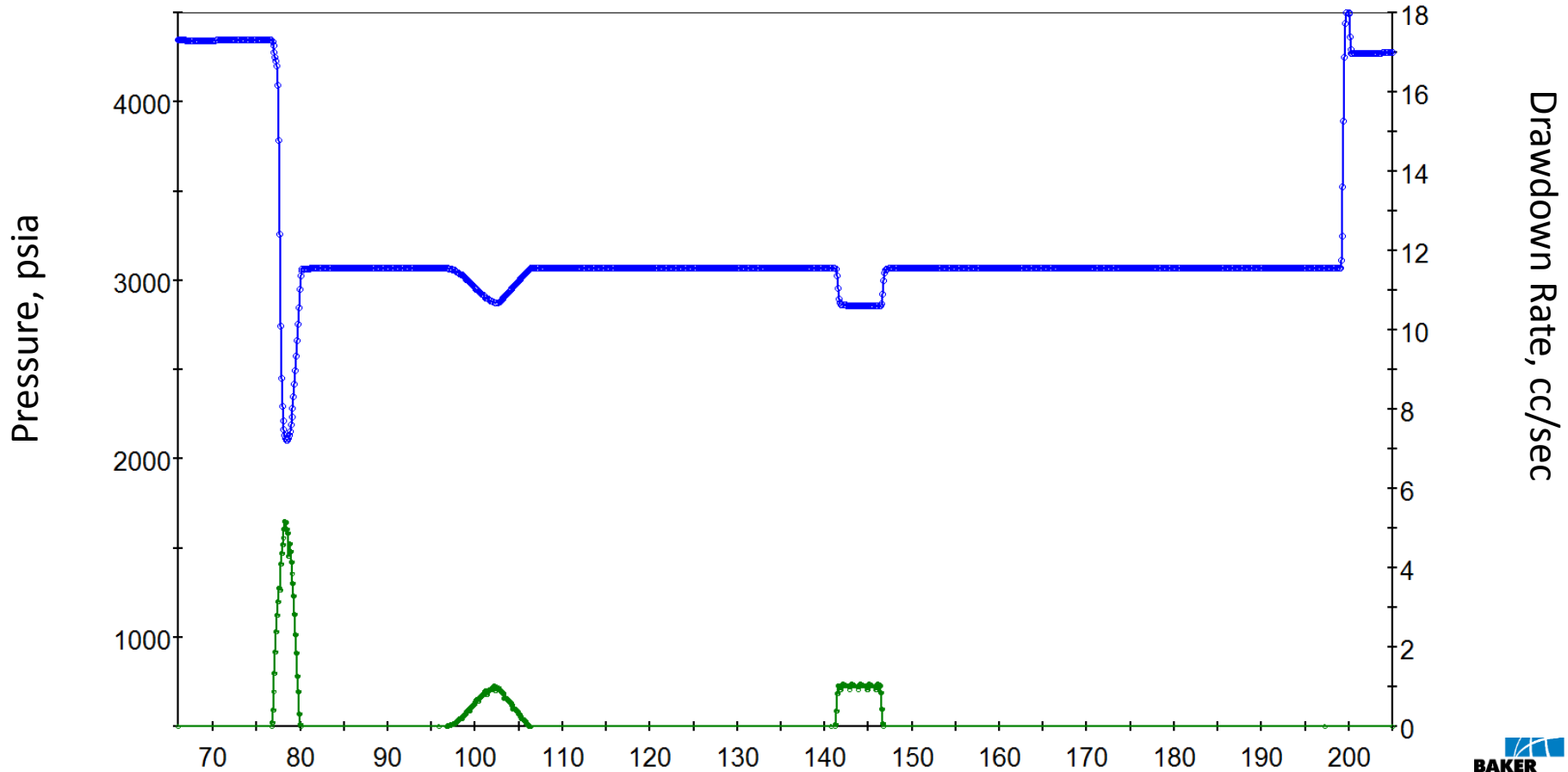
Data to surface  
Constantly.

Results:  
Pressure  
Temperature  
Mobility  
Rate  
Etc.

Ability to  
interrupt at any  
time

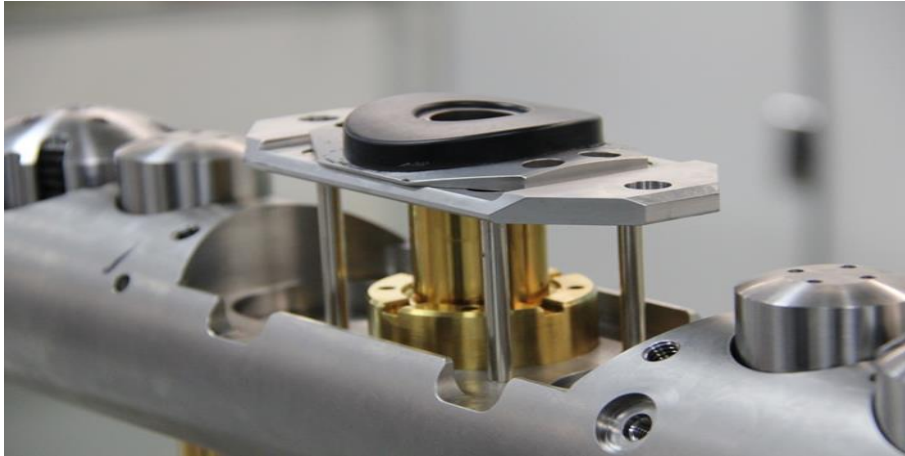


# FTeX™ – In Essence



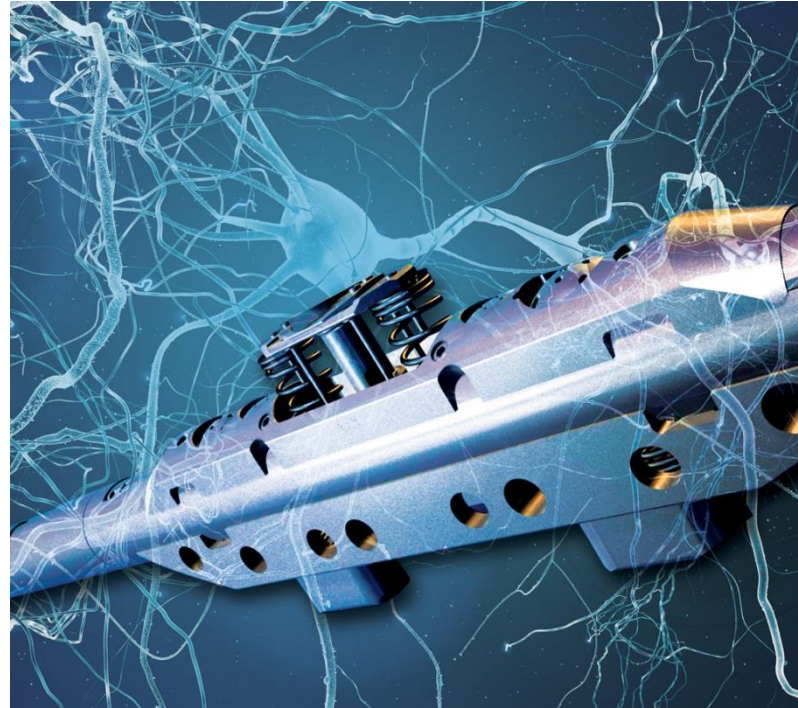
# FTeX™ Smart Test Options

1. Medium Mobility test (default)
2. Unconsolidated formation
3. Low mobility formation
4. High mobility formation
5. Gas
6. Custom Design



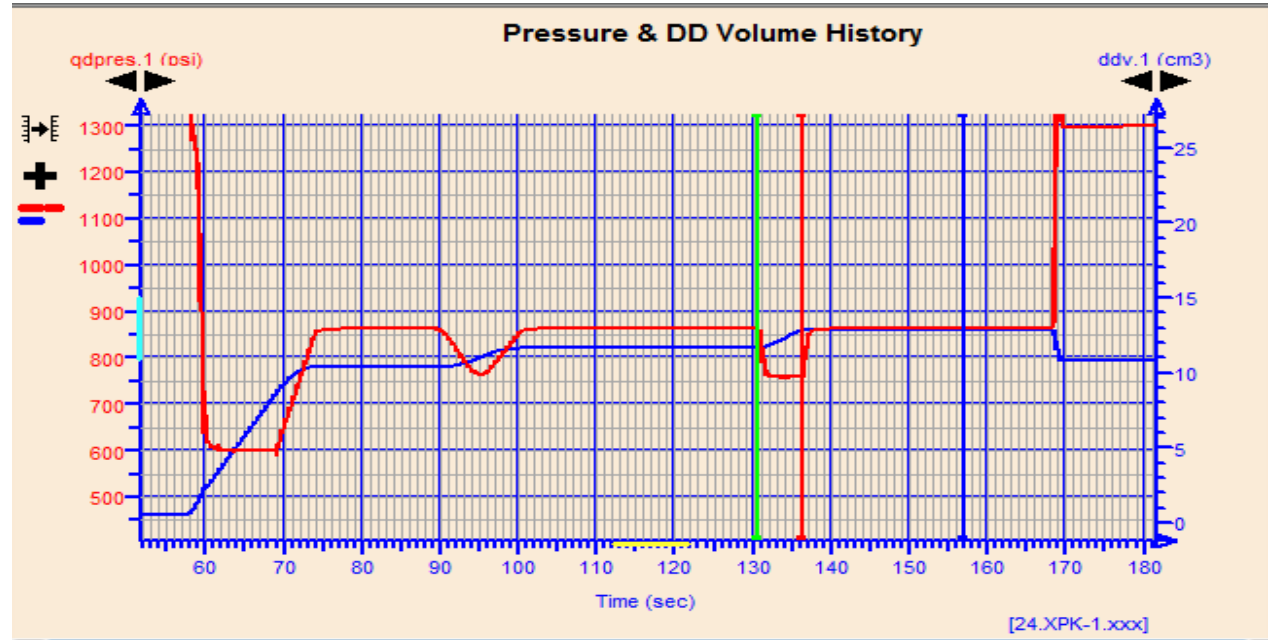
# Case History

- Very Low Mobility to High Mobility
  - $<0.4\text{mD/cp}$  -  $>1000\text{mD/cp}$
- Formation Type:
  - Sandstone



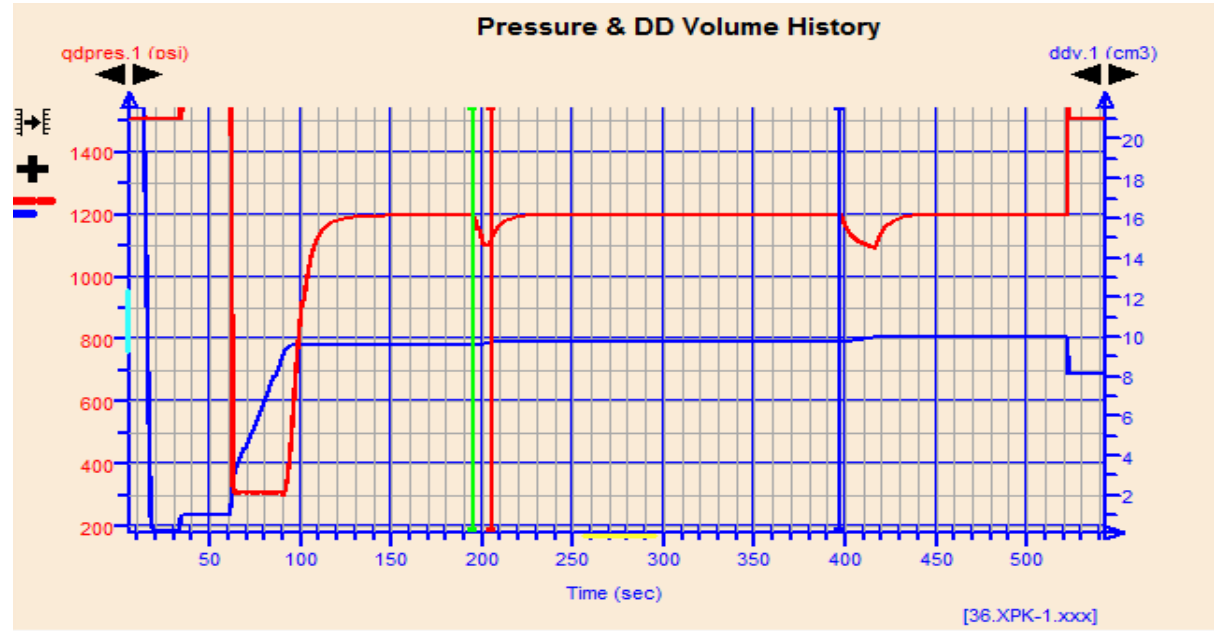
## 6.2 mD/cp test

- Extracted 10cc volume on first DD to avoid super charging
- 2<sup>nd</sup> and 3<sup>rd</sup> DD repeated within 0.1psi
- 3<sup>rd</sup> DD achieved fantastic stable flowing pressure
- 3 DD *within 3 minutes*



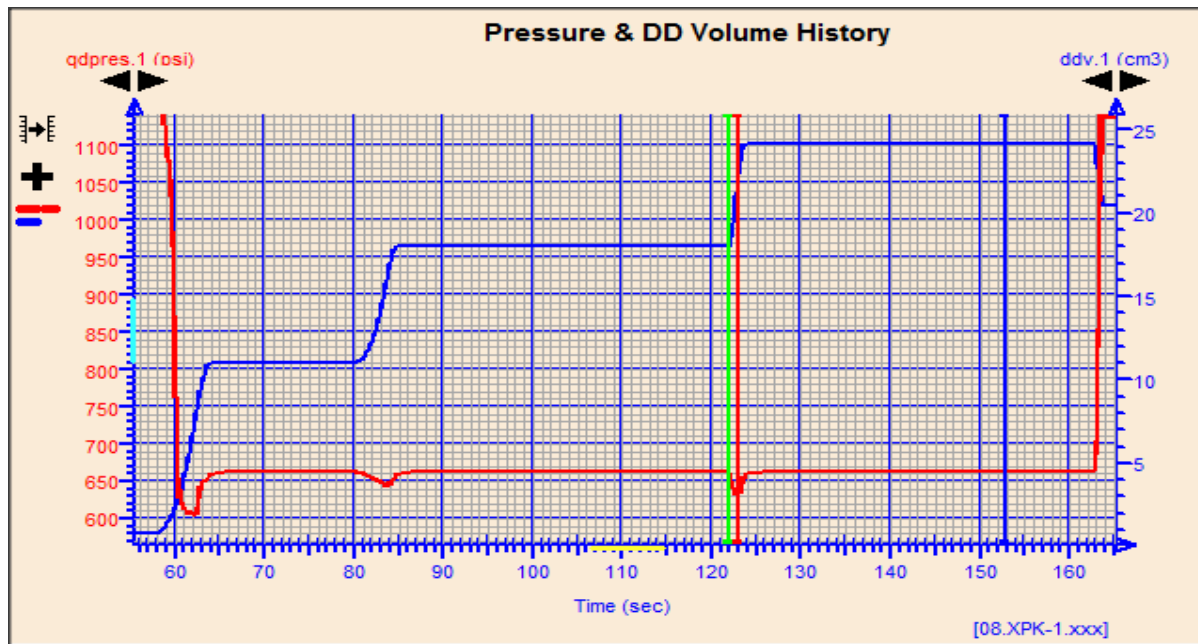
# 0.4 mD/cp test

- Expedited testing in low mobility
- Pressure control on first test
- Subsequent tests “learned formation response”
- **Less than 10min testing**
- Repeated within 0.2psi



# 562 mD/cp test

- Sufficient Rate for even high mobilities
- Hits target pressures rapidly
- Pressure test conducted **within 2min 30sec**



**51**

**PRESSURE  
TESTS  
ACQUIRED  
IN HALF  
THE TIME**

**SAVED**

**20**

**HOURS  
OF RIG  
TIME**

**\$ 500K**

**Savings**

**1  
RUN**

Client Comments

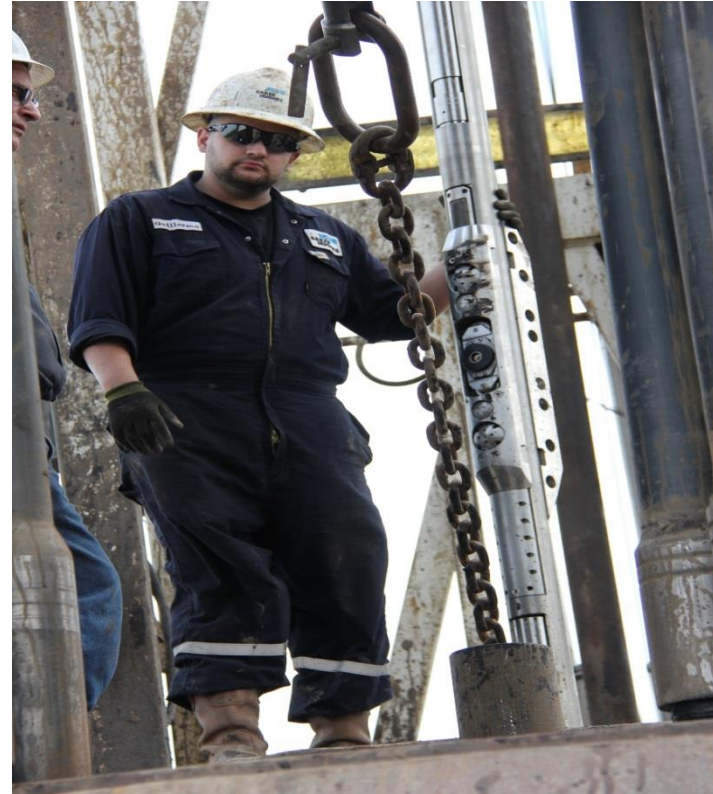
*"...proved to be much faster ..."*

*"... time savings are very clear ..."*

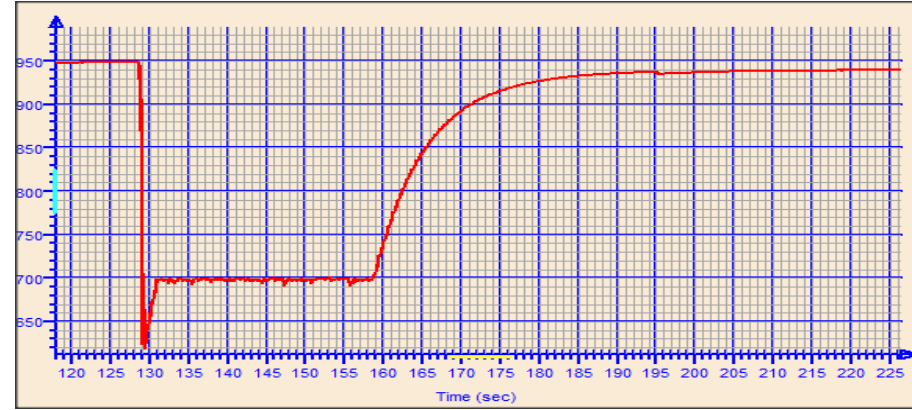
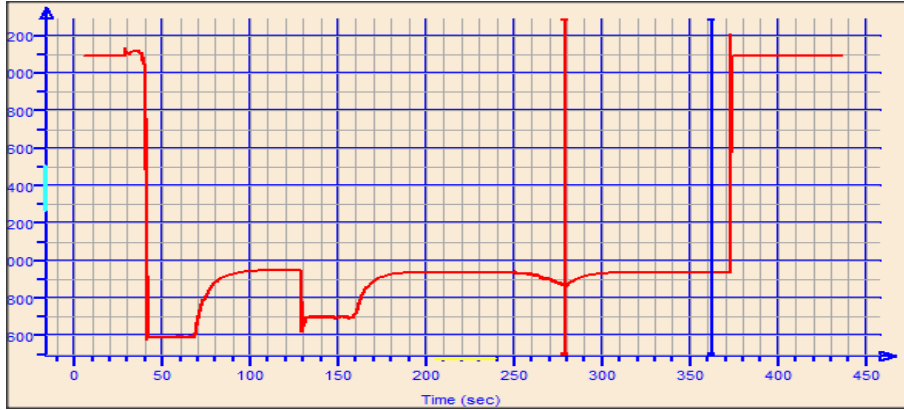
*"... this tool is thus thoroughly recommended..."*

# Deep in the heart of Texas!- Extremely Low Mobility

- Total pretest stations: 304
- Average 6 minutes per station – 3 draw downs per station.
- Mobility of 0.1 mD/cp



# Case History – Extremely Low Mobility



Test Number	Drawdown Rate	Delta Pressure	FBU Pressure	FRA Mobility
1	0.96cc/sec	X543.72psi	X948.52psi	0.195mD/cP
2	0.17cc/sec	X491.48psi	X939.52psi	0.135mD/cP
3	0.09cc/sec	X232.38psi	X938.98psi	0.130mD/cP

# FTeX™ Summary

Downhole Intelligence

Close loop data QC

Maximum control

Extreme automation

Most accurate flowrate determination

Precision and Accuracy

Very high sample rates

Very fast response gauges

Minimal system volume

Flexible operation

Fully combinable

Slim design

Drop-in subs

EFFICIENT  
RELIABLE  
ACCURATE

**COMBINING AUTOMATION WITH REAL-TIME CONTROL  
FOR RELIABLE PRESSURE DATA IN A SINGLE RUN**