

## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co., Inc.**

250 N. Water STE 300  
Wichita, Ks 67202

ATTN: Gregg Smith

### **Red Poll #8-21**

#### **21-10S-56W Lincoln,CO**

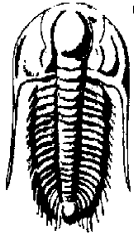
Start Date: 2018.12.01 @ 04:10:00

End Date: 2018.12.01 @ 20:06:00

Job Ticket #: 65379                      DST #: 1

Trilobite Testing, Inc  
1515 Commerce Parkway Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2018.12.11 @ 08:15:27



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Murfin Drilling Co., Inc.  
 250 N. Water STE 300  
 Wichita, Ks 67202  
 ATTN: Gregg Smith

**21-10S-56W Lincoln, CO**

**Red Poll #8-21**

Job Ticket: 65379

**DST#: 1**

Test Start: 2018.12.01 @ 04:10:00

## GENERAL INFORMATION:

Formation: **Pleasanton**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 09:35:15  
 Time Test Ended: 20:06:00  
 Interval: **7376.00 ft (KB) To 7427.00 ft (KB) (TVD)**  
 Total Depth: 7427.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Good  
 Test Type: Conventional Bottom Hole (Initial)  
 Tester: Royal Fisher  
 Unit No: 77  
 Reference Elevations: 5502.00 ft (KB)  
 5489.00 ft (CF)  
 KB to GR/CF: 13.00 ft

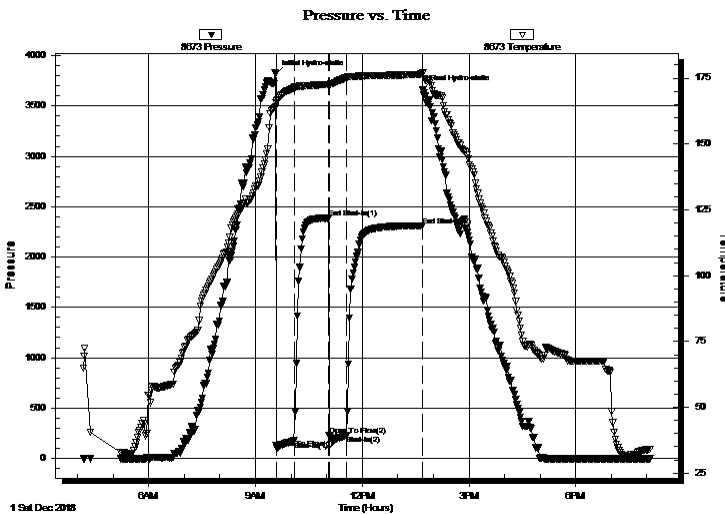
## Serial #: 8673

Inside

Press@RunDepth: 229.03 psig @ 7377.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2018.12.01 End Date: 2018.12.01 Last Calib.: 2018.12.01  
 Start Time: 04:10:05 End Time: 20:06:00 Time On Btm: 2018.12.01 @ 09:33:15  
 Time Off Btm: 2018.12.01 @ 13:42:00

TEST COMMENT: 30 - IFP - BOB in 4 mins. GTS at the end of the open  
 60 - ISI - Weak Return started 5 mins into shut in and built to 1/4"  
 30 - FFP - BOB in 4 mins  
 120 - FSI - BOB in 28 mins

## PRESSURE SUMMARY



| Time (Min.) | Pressure (psig) | Temp (deg F) | Annotation           |
|-------------|-----------------|--------------|----------------------|
| 0           | 3814.92         | 164.26       | Initial Hydro-static |
| 2           | 104.24          | 166.39       | Open To Flow (1)     |
| 32          | 174.09          | 171.24       | Shut-In(1)           |
| 90          | 2385.48         | 172.64       | End Shut-In(1)       |
| 91          | 229.34          | 172.64       | Open To Flow (2)     |
| 121         | 229.03          | 175.25       | Shut-In(2)           |
| 248         | 2306.92         | 176.48       | End Shut-In(2)       |
| 249         | 3662.20         | 177.03       | Final Hydro-static   |

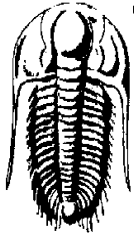
## Recovery

| Length (ft) | Description               | Volume (bbl) |
|-------------|---------------------------|--------------|
| 279.00      | VGMO - 70%g - 15%o - 15%m | 1.37         |
| 93.00       | GMCO - 15%g - 30%m - 55%o | 0.46         |
| 93.00       | GMO - 40%g - 30%o - 30%m  | 0.46         |
| 93.00       | GOCM - 55%g - 15%o - 30%m | 0.46         |
| 114.00      | GOCM - 10%g - 10%o - 80%m | 1.17         |

## Gas Rates

| Choke (inches) | Pressure (psig) | Gas Rate (Mcf/d) |
|----------------|-----------------|------------------|
|                |                 |                  |





**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co., Inc.

**21-10S-56W Lincoln, CO**

250 N. Water STE 300  
Wichita, Ks 67202

**Red Poll #8-21**

Job Ticket: 65379

**DST#: 1**

ATTN: Gregg Smith

Test Start: 2018.12.01 @ 04:10:00

## Tool Information

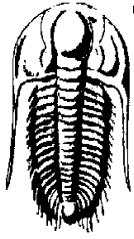
|                           |                    |                       |                                |                                    |
|---------------------------|--------------------|-----------------------|--------------------------------|------------------------------------|
| Drill Pipe:               | Length: 6797.19 ft | Diameter: 3.25 inches | Volume: 69.74 bbl              | Tool Weight: 2500.00 lb            |
| Heavy Wt. Pipe:           | Length: 0.00 ft    | Diameter: 0.00 inches | Volume: 0.00 bbl               | Weight set on Packer: 25000.00 lb  |
| Drill Collar:             | Length: 557.81 ft  | Diameter: 2.25 inches | Volume: 2.74 bbl               | Weight to Pull Loose: 70000.00 lb  |
|                           |                    |                       | <u>Total Volume: 72.48 bbl</u> | Tool Chased 0.00 ft                |
| Drill Pipe Above KB:      | 10.00 ft           |                       |                                | String Weight: Initial 44000.00 lb |
| Depth to Top Packer:      | 7376.00 ft         |                       |                                | Final 60000.00 lb                  |
| Depth to Bottom Packer:   | ft                 |                       |                                |                                    |
| Interval between Packers: | 51.00 ft           |                       |                                |                                    |
| Tool Length:              | 82.00 ft           |                       |                                |                                    |
| Number of Packers:        | 2                  | Diameter: 6.75 inches |                                |                                    |

Tool Comments:

## Tool Description

**Length (ft) Serial No. Position Depth (ft) Accum. Lengths**

| Tool Description          | Length (ft)  | Serial No. | Position | Depth (ft) | Accum. Lengths             |
|---------------------------|--------------|------------|----------|------------|----------------------------|
| Shut In Tool              | 5.00         |            |          | 7350.00    |                            |
| Sampler                   | 2.00         |            |          | 7352.00    |                            |
| Hydraulic tool            | 5.00         |            |          | 7357.00    |                            |
| Jars                      | 5.00         |            |          | 7362.00    |                            |
| Safety Joint              | 3.00         |            |          | 7365.00    |                            |
| Change Over Sub           | 1.00         |            |          | 7366.00    |                            |
| Packer - Shale            | 5.00         |            |          | 7371.00    |                            |
| Packer                    | 5.00         |            |          | 7376.00    | 31.00 Bottom Of Top Packer |
| Stubb                     | 1.00         |            |          | 7377.00    |                            |
| Recorder                  | 0.00         | 8360       | Inside   | 7377.00    |                            |
| Recorder                  | 0.00         | 8673       | Inside   | 7377.00    |                            |
| Perforations              | 14.00        |            | Outside  | 7391.00    |                            |
| Change Over Sub           | 1.00         |            | Outside  | 7392.00    |                            |
| Drill Pipe                | 31.00        |            |          | 7423.00    |                            |
| Change Over Sub           | 1.00         |            |          | 7424.00    |                            |
| Bullnose                  | 3.00         |            |          | 7427.00    | 51.00 Anchor Tool          |
| <b>Total Tool Length:</b> | <b>82.00</b> |            |          |            |                            |



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co., Inc.

**21-10S-56W Lincoln, CO**

250 N. Water STE 300  
Wichita, Ks 67202

**Red Poll #8-21**

Job Ticket: 65379

**DST#: 1**

ATTN: Gregg Smith

Test Start: 2018.12.01 @ 04:10:00

## Mud and Cushion Information

Mud Type: Gel Chem  
Mud Weight: 0.00 lb/gal  
Viscosity: 74.00 sec/qt  
Water Loss: 6.38 in<sup>3</sup>  
Resistivity: ohm.m  
Salinity: 300.00 ppm  
Filter Cake: 1.00 inches

Cushion Type:  
Cushion Length: ft  
Cushion Volume: bbl  
Gas Cushion Type:  
Gas Cushion Pressure: psig

Oil API: deg API  
Water Salinity: ppm

## Recovery Information

Recovery Table

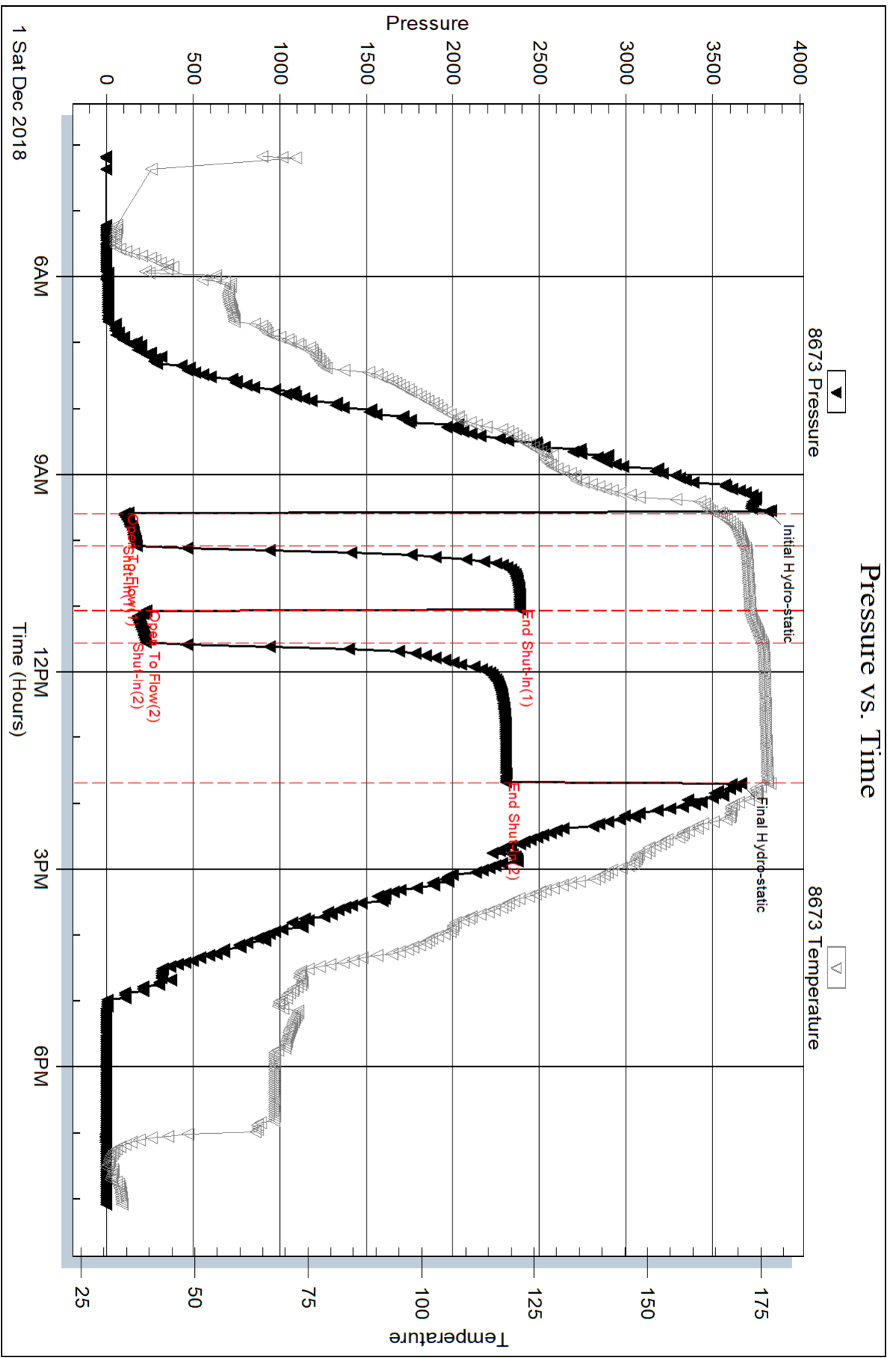
| Length<br>ft | Description               | Volume<br>bbl |
|--------------|---------------------------|---------------|
| 279.00       | VGMO - 70%g - 15%o - 15%m | 1.372         |
| 93.00        | GMCO - 15%g - 30%m - 55%o | 0.457         |
| 93.00        | GMO - 40%g - 30%o - 30%m  | 0.457         |
| 93.00        | GOCM - 55%g - 15%o - 30%m | 0.458         |
| 114.00       | GOCM - 10%g - 10%o - 80%m | 1.170         |

Total Length: 672.00 ft      Total Volume: 3.914 bbl

Num Fluid Samples: 0      Num Gas Bombs: 0      Serial #:

Laboratory Name:      Laboratory Location:

Recovery Comments:



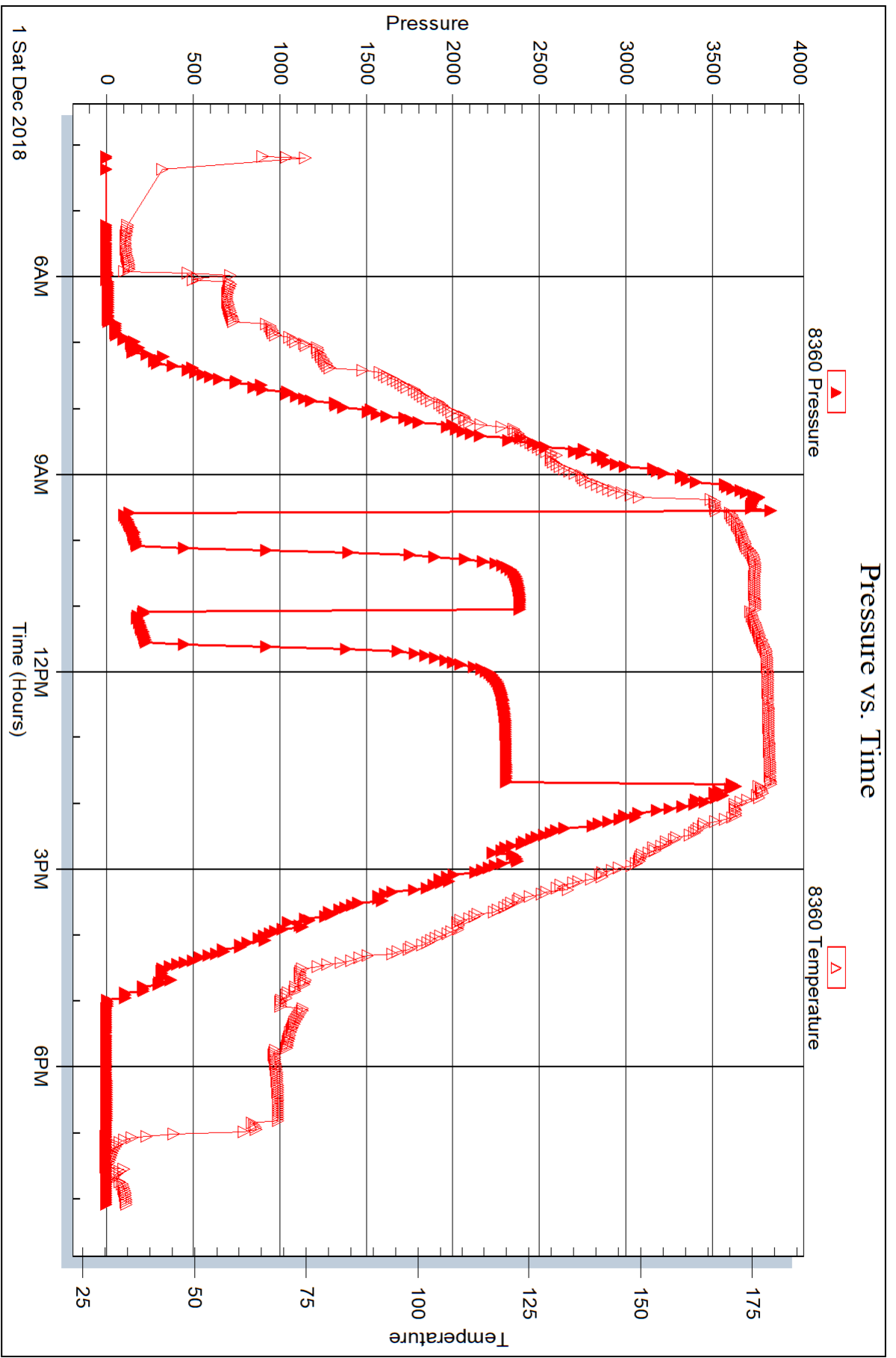
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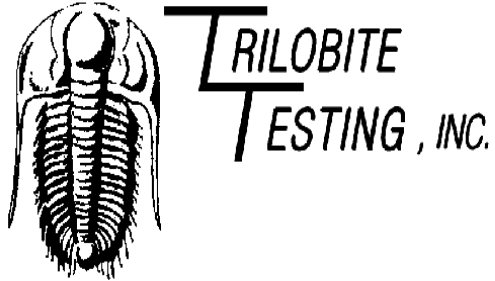
Inside

Murfin Drilling Co., Inc.

Red Poll #8-21

DST Test Number: 1





## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co., Inc.**

250 N. Water STE 300  
Wichita, Ks 67202

ATTN: Gregg Smith

### **Red Poll #8-21**

#### **21-10S-56W Lincoln,CO**

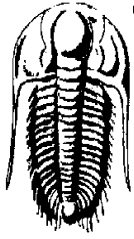
Start Date: 2018.12.02 @ 18:44:00

End Date: 2018.12.03 @ 08:05:15

Job Ticket #: 65380                      DST #: 2

Trilobite Testing, Inc  
1515 Commerce Parkway Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2018.12.11 @ 08:15:07



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Murfin Drilling Co., Inc.  
 250 N. Water STE 300  
 Wichita, Ks 67202  
 ATTN: Gregg Smith

**21-10S-56W Lincoln, CO**  
**Red Poll #8-21**  
 Job Ticket: 65380 **DST#: 2**  
 Test Start: 2018.12.02 @ 18:44:00

## GENERAL INFORMATION:

Formation: **Marmalon C**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 23:40:30  
 Time Test Ended: 08:05:15  
 Interval: **7428.00 ft (KB) To 7470.00 ft (KB) (TVD)**  
 Total Depth: 7470.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Good  
 Test Type: Conventional Bottom Hole (Initial)  
 Tester: Royal Fisher  
 Unit No: 77  
 Reference Elevations: 5502.00 ft (KB)  
 5489.00 ft (CF)  
 KB to GR/CF: 13.00 ft

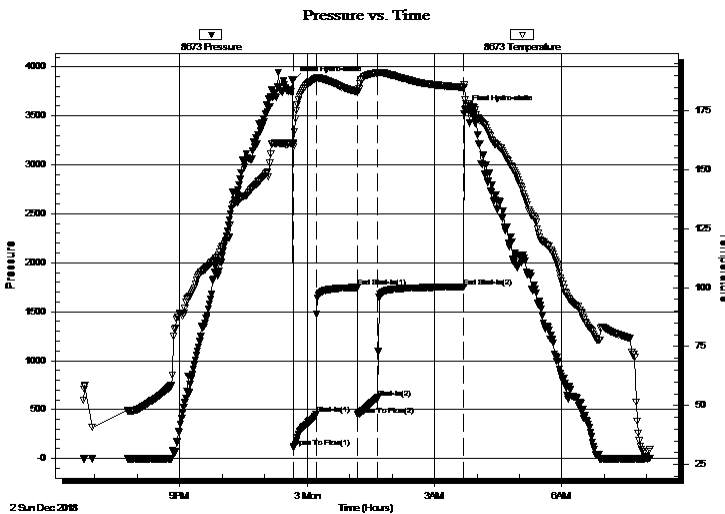
## Serial #: 8673

Inside

Press@RunDepth: 620.61 psig @ 7429.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2018.12.02 End Date: 2018.12.03 Last Calib.: 2018.12.03  
 Start Time: 18:44:05 End Time: 08:05:15 Time On Btm: 2018.12.02 @ 23:40:00  
 Time Off Btm: 2018.12.03 @ 03:43:15

TEST COMMENT: 30 - IFP - BOB in 13 mins w ith GTS in 29 min.  
 60 - ISI - Return built to 6 3/4"  
 30 - FFP - BOB in 12 mins  
 120 - FSI - Return built to 4"

## PRESSURE SUMMARY



| Time (Min.) | Pressure (psig) | Temp (deg F) | Annotation           |
|-------------|-----------------|--------------|----------------------|
| 0           | 3859.81         | 161.46       | Initial Hydro-static |
| 1           | 114.85          | 160.88       | Open To Flow (1)     |
| 33          | 449.97          | 188.78       | Shut-In(1)           |
| 91          | 1748.28         | 183.18       | End Shut-In(1)       |
| 92          | 447.50          | 182.92       | Open To Flow (2)     |
| 120         | 620.61          | 191.08       | Shut-In(2)           |
| 242         | 1753.09         | 184.91       | End Shut-In(2)       |
| 244         | 3567.17         | 179.75       | Final Hydro-static   |

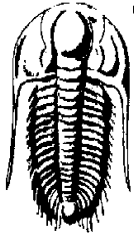
## Recovery

| Length (ft) | Description | Volume (bbl) |
|-------------|-------------|--------------|
| 1342.00     | SW - 100%w  | 10.79        |
| 0.00        | GTS         | 0.00         |
|             |             |              |
|             |             |              |
|             |             |              |

## Gas Rates

| Choke (inches) | Pressure (psig) | Gas Rate (Mcf/d) |
|----------------|-----------------|------------------|
|                |                 |                  |





**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co., Inc.

**21-10S-56W Lincoln, CO**

250 N. Water STE 300  
Wichita, Ks 67202

**Red Poll #8-21**

Job Ticket: 65380

**DST#: 2**

ATTN: Gregg Smith

Test Start: 2018.12.02 @ 18:44:00

## Tool Information

|                           |                    |                       |                                |                        |             |
|---------------------------|--------------------|-----------------------|--------------------------------|------------------------|-------------|
| Drill Pipe:               | Length: 6871.19 ft | Diameter: 3.25 inches | Volume: 70.50 bbl              | Tool Weight:           | 2500.00 lb  |
| Heavy Wt. Pipe:           | Length: 0.00 ft    | Diameter: 0.00 inches | Volume: 0.00 bbl               | Weight set on Packer:  | 25000.00 lb |
| Drill Collar:             | Length: 557.81 ft  | Diameter: 2.25 inches | Volume: 2.74 bbl               | Weight to Pull Loose:  | 105000.0 lb |
|                           |                    |                       | <u>Total Volume: 73.24 bbl</u> | Tool Chased            | 0.00 ft     |
| Drill Pipe Above KB:      | 30.00 ft           |                       |                                | String Weight: Initial | 95000.00 lb |
| Depth to Top Packer:      | 7428.00 ft         |                       |                                | Final                  | 96000.00 lb |
| Depth to Bottom Packer:   | ft                 |                       |                                |                        |             |
| Interval between Packers: | 42.00 ft           |                       |                                |                        |             |
| Tool Length:              | 71.00 ft           |                       |                                |                        |             |
| Number of Packers:        | 2                  | Diameter: 6.75 inches |                                |                        |             |

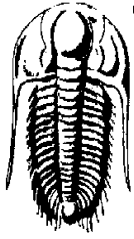
Tool Comments:

## Tool Description

**Length (ft) Serial No. Position Depth (ft) Accum. Lengths**

|                 |       |      |         |         |                            |
|-----------------|-------|------|---------|---------|----------------------------|
| Shut In Tool    | 5.00  |      |         | 7404.00 |                            |
| Hydraulic tool  | 5.00  |      |         | 7409.00 |                            |
| Jars            | 5.00  |      |         | 7414.00 |                            |
| Safety Joint    | 3.00  |      |         | 7417.00 |                            |
| Change Over Sub | 1.00  |      |         | 7418.00 |                            |
| Packer - Shale  | 5.00  |      |         | 7423.00 |                            |
| Packer          | 5.00  |      |         | 7428.00 | 29.00 Bottom Of Top Packer |
| Stubb           | 1.00  |      |         | 7429.00 |                            |
| Recorder        | 0.00  | 8360 | Inside  | 7429.00 |                            |
| Recorder        | 0.00  | 8673 | Inside  | 7429.00 |                            |
| Perforations    | 5.00  |      | Outside | 7434.00 |                            |
| Change Over Sub | 1.00  |      | Outside | 7435.00 |                            |
| Drill Pipe      | 31.00 |      |         | 7466.00 |                            |
| Change Over Sub | 1.00  |      |         | 7467.00 |                            |
| Bullnose        | 3.00  |      |         | 7470.00 | 42.00 Anchor Tool          |

**Total Tool Length: 71.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co., Inc.

**21-10S-56W Lincoln, CO**

250 N. Water STE 300  
Wichita, Ks 67202

**Red Poll #8-21**

Job Ticket: 65380

**DST#: 2**

ATTN: Gregg Smith

Test Start: 2018.12.02 @ 18:44:00

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

81668 ppm

Viscosity: 86.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.18 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 800.00 ppm

Filter Cake: 1.00 inches

## Recovery Information

Recovery Table

| Length<br>ft | Description | Volume<br>bbl |
|--------------|-------------|---------------|
| 1342.00      | SW - 100%w  | 10.790        |
| 0.00         | GTS         | 0.000         |

Total Length: 1342.00 ft      Total Volume: 10.790 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

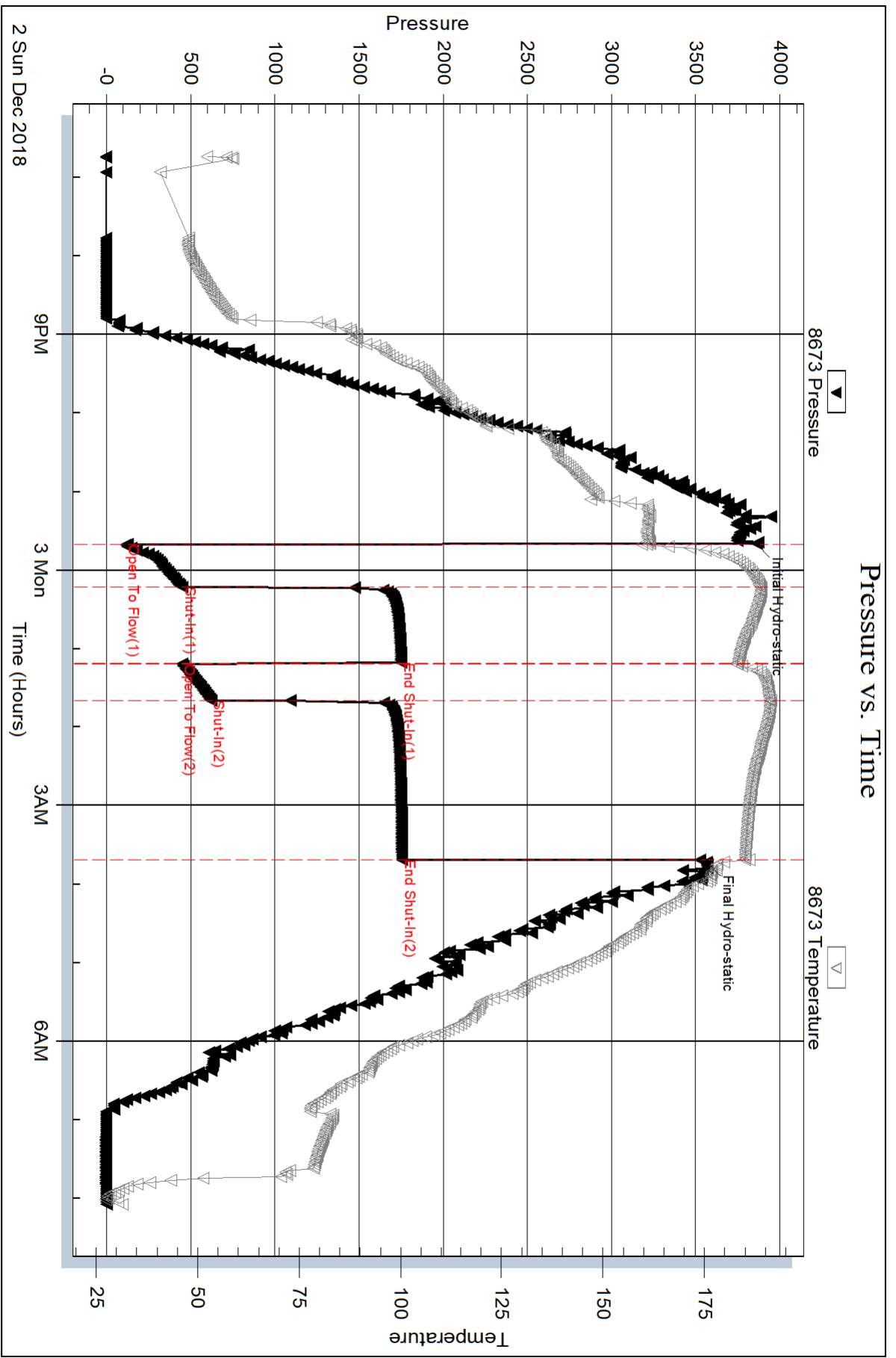
Serial #: 8673

Inside

Murfin Drilling Co., Inc.

Red Poll #8-21

DST Test Number: 2



Triobite Testing, Inc

Ref. No: 65380

Printed: 2018.12.11 @ 08:15:07

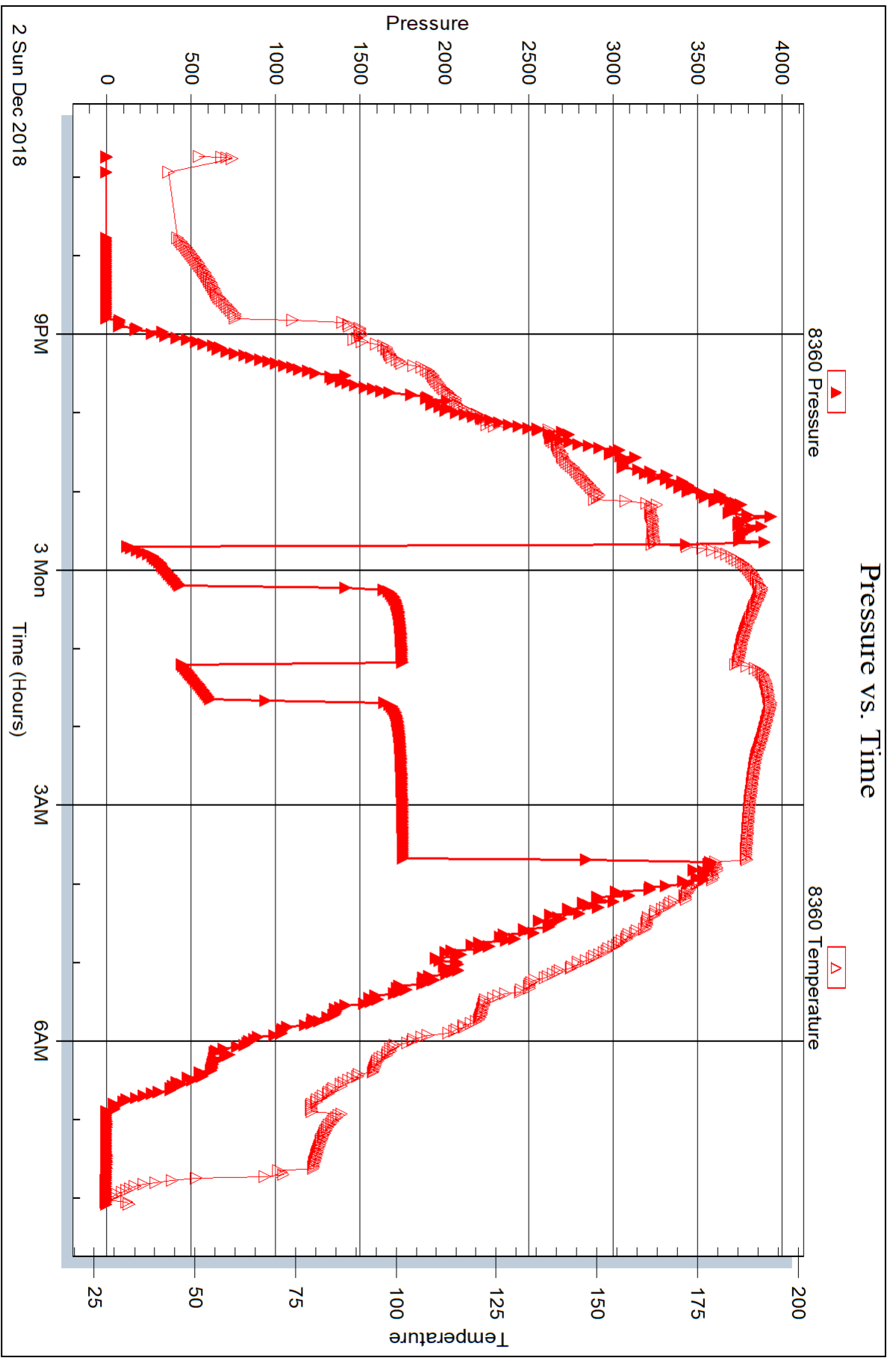
Serial #: 8360

Inside

Murfin Drilling Co., Inc.

Red Poll #8-21

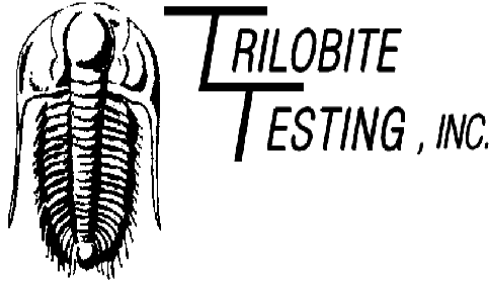
DST Test Number: 2



Triobite Testing, Inc

Ref. No: 65380

Printed: 2018.12.11 @ 08:15:08



## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co., Inc.**

250 N. Water STE 300  
Wichita, Ks 67202

ATTN: Gregg Smith

### **Red Poll #8-21**

#### **21-10S-56W Lincoln,CO**

Start Date: 2018.12.03 @ 05:02:15

End Date: 2018.12.03 @ 07:36:29

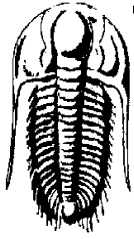
Job Ticket #: 65381                      DST #: 3

Trilobite Testing, Inc  
1515 Commerce Parkway Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2018.12.11 @ 08:14:44







**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co., Inc.

**21-10S-56W Lincoln, CO**

250 N. Water STE 300  
Wichita, Ks 67202

**Red Poll #8-21**

Job Ticket: 65381

**DST#: 3**

ATTN: Gregg Smith

Test Start: 2018.12.03 @ 05:02:15

## Tool Information

|                           |                    |                       |                                |                        |             |
|---------------------------|--------------------|-----------------------|--------------------------------|------------------------|-------------|
| Drill Pipe:               | Length: 6919.00 ft | Diameter: 3.25 inches | Volume: 70.99 bbl              | Tool Weight:           | 2500.00 lb  |
| Heavy Wt. Pipe:           | Length: 0.00 ft    | Diameter: 0.00 inches | Volume: 0.00 bbl               | Weight set on Packer:  | lb          |
| Drill Collar:             | Length: 557.81 ft  | Diameter: 2.25 inches | Volume: 2.74 bbl               | Weight to Pull Loose:  | lb          |
|                           |                    |                       | <u>Total Volume: 73.73 bbl</u> | Tool Chased            | ft          |
| Drill Pipe Above KB:      | 15.81 ft           |                       |                                | String Weight: Initial | 130000.0 lb |
| Depth to Top Packer:      | 7490.00 ft         |                       |                                | Final                  | 130000.0 lb |
| Depth to Bottom Packer:   | ft                 |                       |                                |                        |             |
| Interval between Packers: | 47.00 ft           |                       |                                |                        |             |
| Tool Length:              | 76.00 ft           |                       |                                |                        |             |
| Number of Packers:        | 2                  | Diameter: 6.75 inches |                                |                        |             |

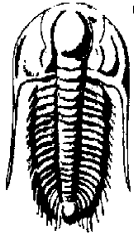
Tool Comments:

## Tool Description

**Length (ft) Serial No. Position Depth (ft) Accum. Lengths**

|                 |       |      |         |         |                            |
|-----------------|-------|------|---------|---------|----------------------------|
| Shut In Tool    | 5.00  |      |         | 7466.00 |                            |
| Hydraulic tool  | 5.00  |      |         | 7471.00 |                            |
| Jars            | 5.00  |      |         | 7476.00 |                            |
| Safety Joint    | 3.00  |      |         | 7479.00 |                            |
| Change Over Sub | 1.00  |      |         | 7480.00 |                            |
| Packer - Shale  | 5.00  |      |         | 7485.00 |                            |
| Packer          | 5.00  |      |         | 7490.00 | 29.00 Bottom Of Top Packer |
| Stubb           | 1.00  |      |         | 7491.00 |                            |
| Recorder        | 0.00  | 8360 | Inside  | 7491.00 |                            |
| Recorder        | 0.00  | 8673 | Inside  | 7491.00 |                            |
| Perforations    | 10.00 |      | Outside | 7501.00 |                            |
| Change Over Sub | 1.00  |      | Outside | 7502.00 |                            |
| Drill Pipe      | 31.00 |      |         | 7533.00 |                            |
| Change Over Sub | 1.00  |      |         | 7534.00 |                            |
| Bullnose        | 3.00  |      |         | 7537.00 | 47.00 Anchor Tool          |

**Total Tool Length: 76.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co., Inc.

**21-10S-56W Lincoln, CO**

250 N. Water STE 300  
Wichita, Ks 67202

**Red Poll #8-21**

Job Ticket: 65381

**DST#: 3**

ATTN: Gregg Smith

Test Start: 2018.12.03 @ 05:02:15

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 84.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.18 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 900.00 ppm

Filter Cake: 1.00 inches

## Recovery Information

Recovery Table

| Length<br>ft | Description | Volume<br>bbl |
|--------------|-------------|---------------|
| 15.00        | Mud         | 0.074         |

Total Length: 15.00 ft      Total Volume: 0.074 bbl

Num Fluid Samples: 0

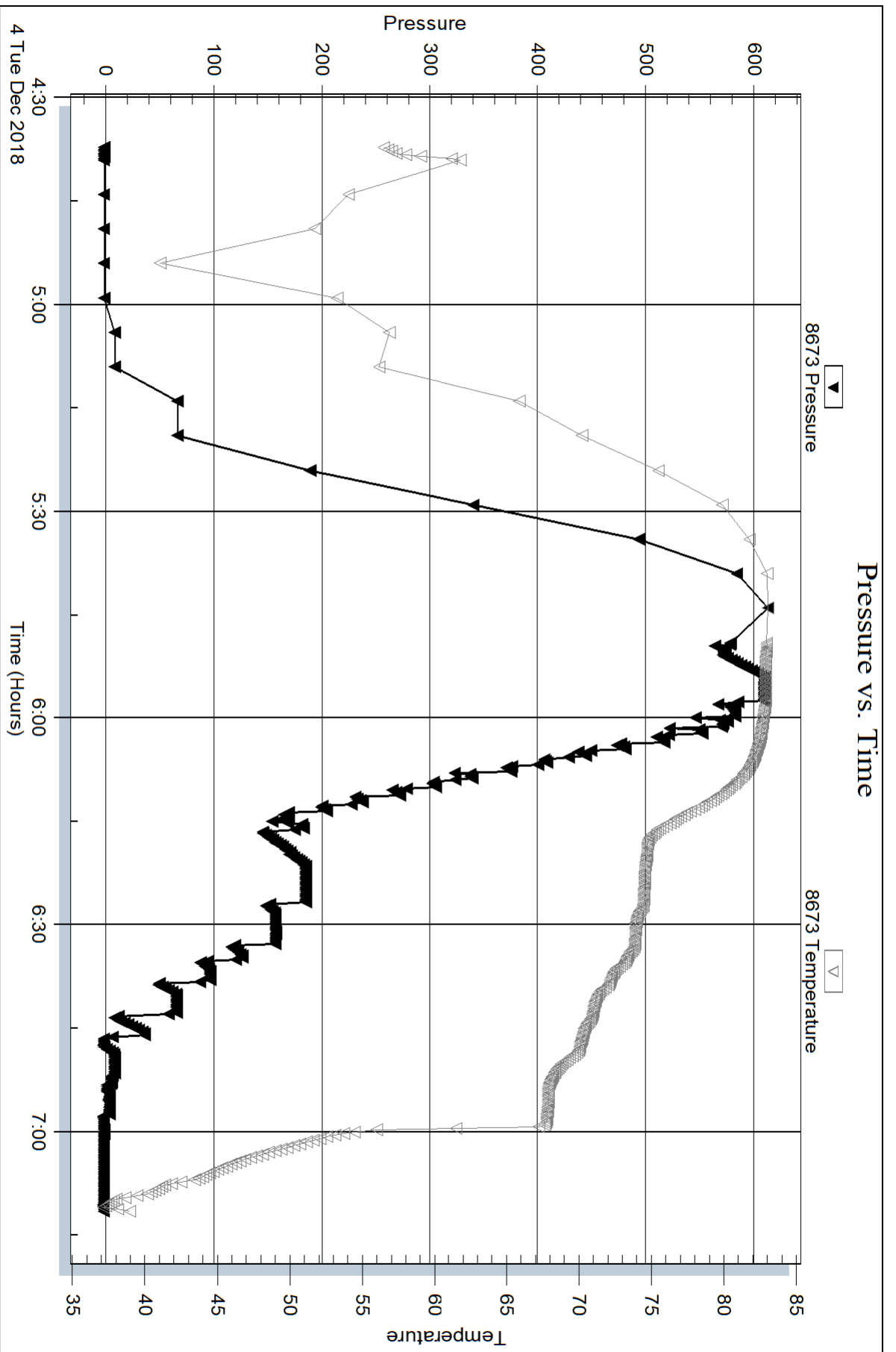
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:



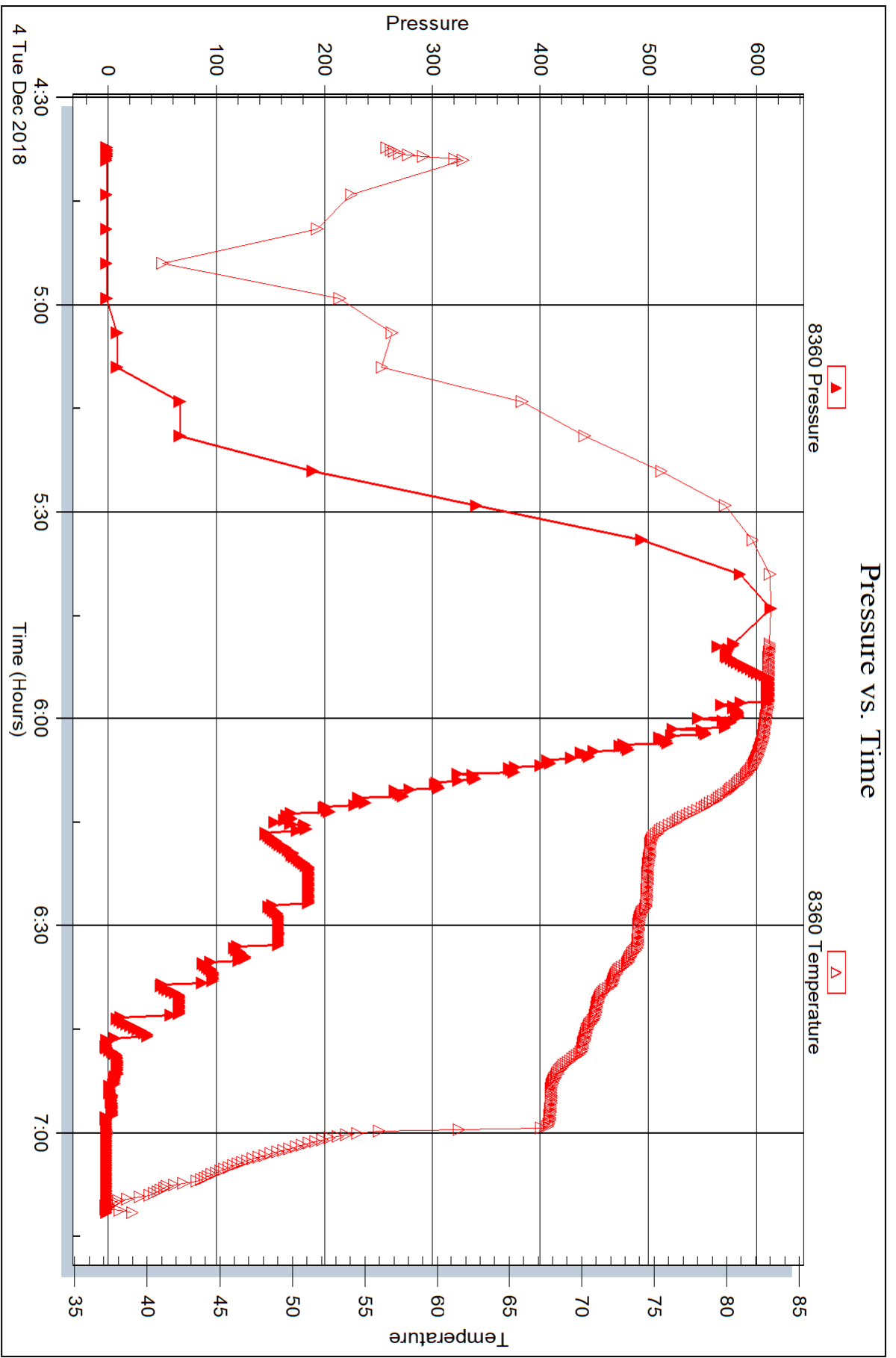
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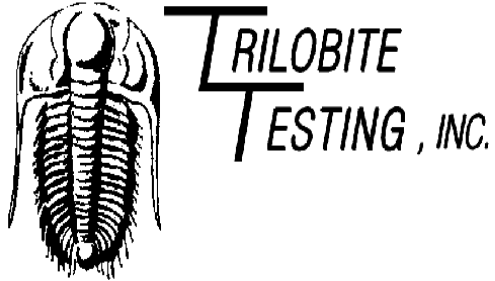
Inside

Murfin Drilling Co., Inc.

Red Poll #8-21

DST Test Number: 3





## DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co., Inc.**

250 N. Water STE 300  
Wichita, Ks 67202

ATTN: Gregg Smith

### **Red Poll #8-21**

#### **21-10S-56W Lincoln,CO**

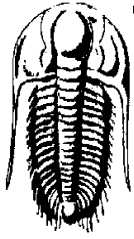
Start Date: 2018.12.04 @ 21:42:00

End Date: 2018.12.05 @ 12:05:45

Job Ticket #: 65382                      DST #: 4

Trilobite Testing, Inc  
1515 Commerce Parkway Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2018.12.11 @ 08:14:14



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Murfin Drilling Co., Inc.  
 250 N. Water STE 300  
 Wichita, Ks 67202  
 ATTN: Gregg Smith

**21-10S-56W Lincoln, CO**

**Red Poll #8-21**

Job Ticket: 65382

**DST#: 4**

Test Start: 2018.12.04 @ 21:42:00

## GENERAL INFORMATION:

Formation: **Lower Fort Scott**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 02:40:30  
 Time Test Ended: 12:05:45  
 Interval: **7490.00 ft (KB) To 7537.00 ft (KB) (TVD)**  
 Total Depth: 7537.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Good  
 Test Type: Conventional Bottom Hole (Initial)  
 Tester: Royal Fisher  
 Unit No: #77  
 Reference Elevations: 5502.00 ft (KB)  
 5489.00 ft (CF)  
 KB to GR/CF: 13.00 ft

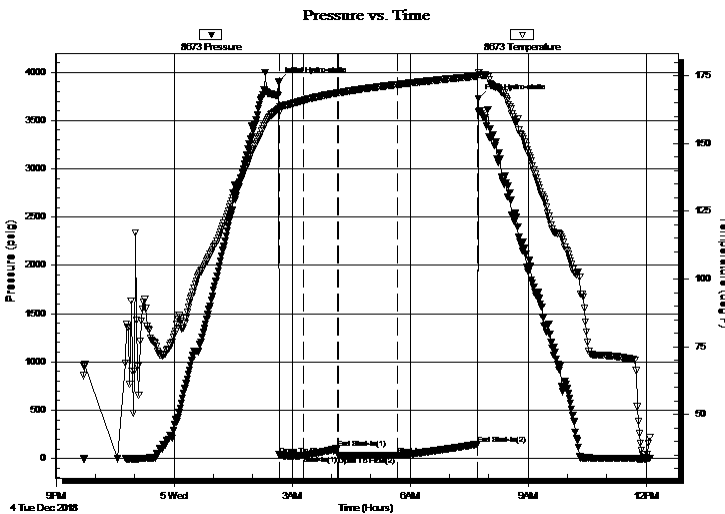
**Serial #: 8673**

**Inside**

Press@RunDepth: 30.59 psig @ 7491.00 ft (KB)  
 Start Date: 2018.12.04 End Date: 2018.12.05  
 Start Time: 21:42:05 End Time: 12:05:45  
 Capacity: 8000.00 psig  
 Last Calib.: 2018.12.05  
 Time On Btm: 2018.12.05 @ 02:39:45  
 Time Off Btm: 2018.12.05 @ 07:44:00

TEST COMMENT: 30 - IFP - Surface blow built up to 1 1/4"  
 60 - ISI - No Return  
 90 - FFP - Surface blow built up to 1"  
 120 - FSI - No Return

## PRESSURE SUMMARY



| Time (Min.) | Pressure (psig) | Temp (deg F) | Annotation           |
|-------------|-----------------|--------------|----------------------|
| 0           | 3898.01         | 162.74       | Initial Hydro-static |
| 1           | 31.00           | 162.86       | Open To Flow (1)     |
| 37          | 31.36           | 165.98       | Shut-In(1)           |
| 90          | 105.25          | 168.75       | End Shut-In(1)       |
| 91          | 27.03           | 168.73       | Open To Flow (2)     |
| 181         | 30.59           | 171.82       | Shut-In(2)           |
| 304         | 148.62          | 174.91       | End Shut-In(2)       |
| 305         | 3724.07         | 176.14       | Final Hydro-static   |

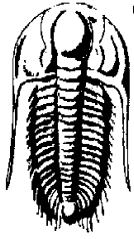
## Recovery

| Length (ft) | Description  | Volume (bbl) |
|-------------|--------------|--------------|
| 5.00        | Mud - 100% m | 0.02         |
|             |              |              |
|             |              |              |
|             |              |              |
|             |              |              |

## Gas Rates

| Choke (inches) | Pressure (psig) | Gas Rate (Mcf/d) |
|----------------|-----------------|------------------|
|                |                 |                  |





**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Murfin Drilling Co., Inc.

**21-10S-56W Lincoln, CO**

250 N. Water STE 300  
Wichita, Ks 67202

**Red Poll #8-21**

Job Ticket: 65382

**DST#: 4**

ATTN: Gregg Smith

Test Start: 2018.12.04 @ 21:42:00

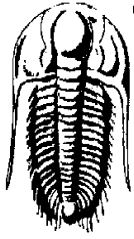
## Tool Information

|                           |                    |                       |                                |                                    |
|---------------------------|--------------------|-----------------------|--------------------------------|------------------------------------|
| Drill Pipe:               | Length: 6919.19 ft | Diameter: 3.25 inches | Volume: 71.00 bbl              | Tool Weight: 2500.00 lb            |
| Heavy Wt. Pipe:           | Length: 0.00 ft    | Diameter: 0.00 inches | Volume: 0.00 bbl               | Weight set on Packer: 25000.00 lb  |
| Drill Collar:             | Length: 557.81 ft  | Diameter: 2.25 inches | Volume: 2.74 bbl               | Weight to Pull Loose: 140000.0 lb  |
|                           |                    |                       | <u>Total Volume: 73.74 bbl</u> | Tool Chased 0.00 ft                |
| Drill Pipe Above KB:      | 18.00 ft           |                       |                                | String Weight: Initial 130000.0 lb |
| Depth to Top Packer:      | 7490.00 ft         |                       |                                | Final 130000.0 lb                  |
| Depth to Bottom Packer:   | ft                 |                       |                                |                                    |
| Interval between Packers: | 47.00 ft           |                       |                                |                                    |
| Tool Length:              | 78.00 ft           |                       |                                |                                    |
| Number of Packers:        | 2                  | Diameter: 6.75 inches |                                |                                    |

Tool Comments:

## Tool Description

| Tool Description          | Length (ft)  | Serial No. | Position | Depth (ft) | Accum. Lengths             |
|---------------------------|--------------|------------|----------|------------|----------------------------|
| Shut In Tool              | 5.00         |            |          | 7464.00    |                            |
| Sampler                   | 2.00         |            |          | 7466.00    |                            |
| Hydraulic tool            | 5.00         |            |          | 7471.00    |                            |
| Jars                      | 5.00         |            |          | 7476.00    |                            |
| Safety Joint              | 3.00         |            |          | 7479.00    |                            |
| Change Over Sub           | 1.00         |            |          | 7480.00    |                            |
| Packer - Shale            | 5.00         |            |          | 7485.00    |                            |
| Packer                    | 5.00         |            |          | 7490.00    | 31.00 Bottom Of Top Packer |
| Stubb                     | 1.00         |            |          | 7491.00    |                            |
| Recorder                  | 0.00         | 8360       | Inside   | 7491.00    |                            |
| Recorder                  | 0.00         | 8673       | Inside   | 7491.00    |                            |
| Perforations              | 10.00        |            | Outside  | 7501.00    |                            |
| Change Over Sub           | 1.00         |            | Outside  | 7502.00    |                            |
| Drill Pipe                | 31.00        |            |          | 7533.00    |                            |
| Change Over Sub           | 1.00         |            |          | 7534.00    |                            |
| Bullnose                  | 3.00         |            |          | 7537.00    | 47.00 Anchor Tool          |
| <b>Total Tool Length:</b> | <b>78.00</b> |            |          |            |                            |



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Murfin Drilling Co., Inc.

**21-10S-56W Lincoln, CO**

250 N. Water STE 300  
Wichita, Ks 67202

**Red Poll #8-21**

Job Ticket: 65382

**DST#: 4**

ATTN: Gregg Smith

Test Start: 2018.12.04 @ 21:42:00

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 84.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.18 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 900.00 ppm

Filter Cake: 1.00 inches

## Recovery Information

Recovery Table

| Length<br>ft | Description | Volume<br>bbl |
|--------------|-------------|---------------|
| 5.00         | Mud - 100%m | 0.025         |

Total Length: 5.00 ft      Total Volume: 0.025 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

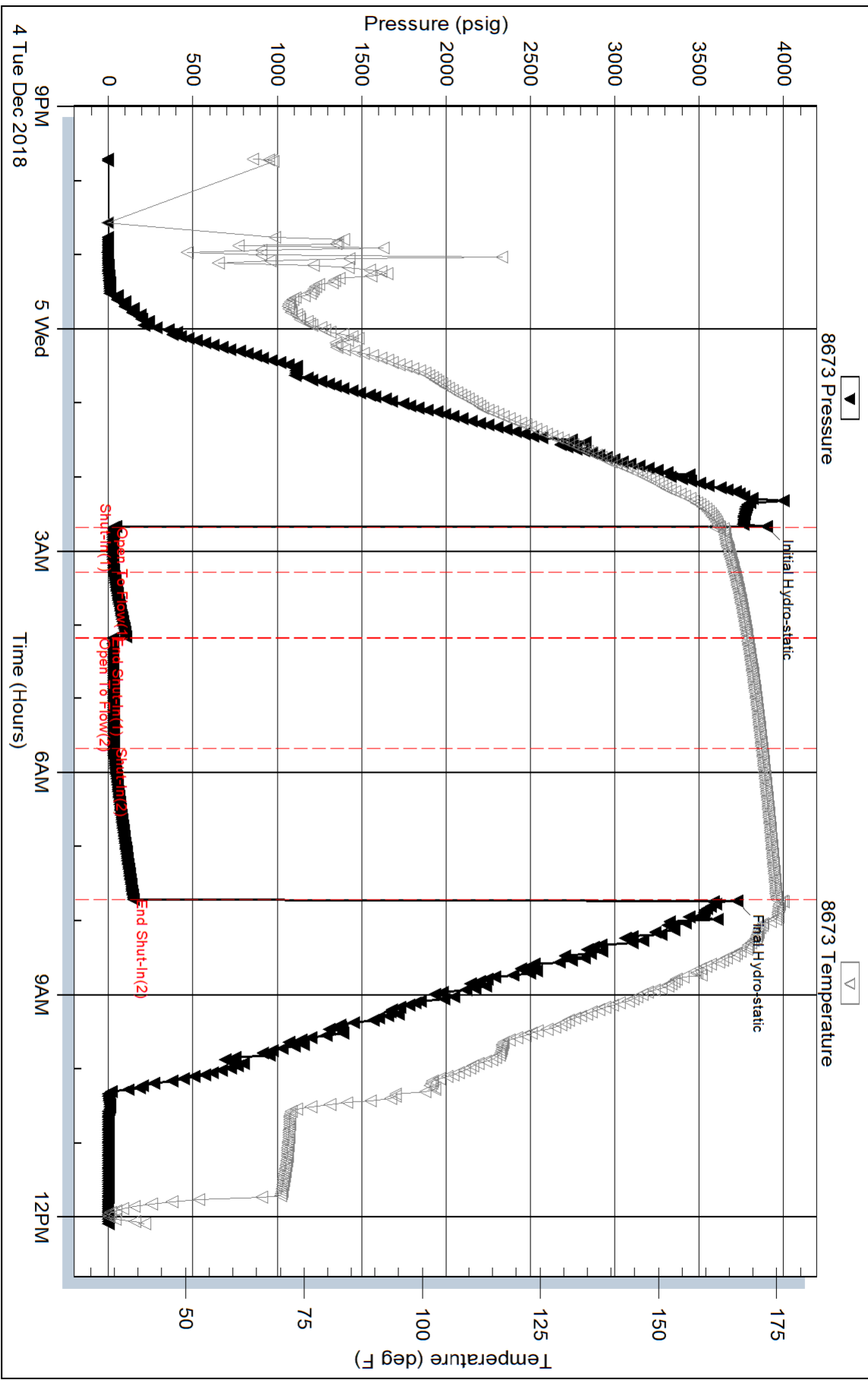
Serial #:

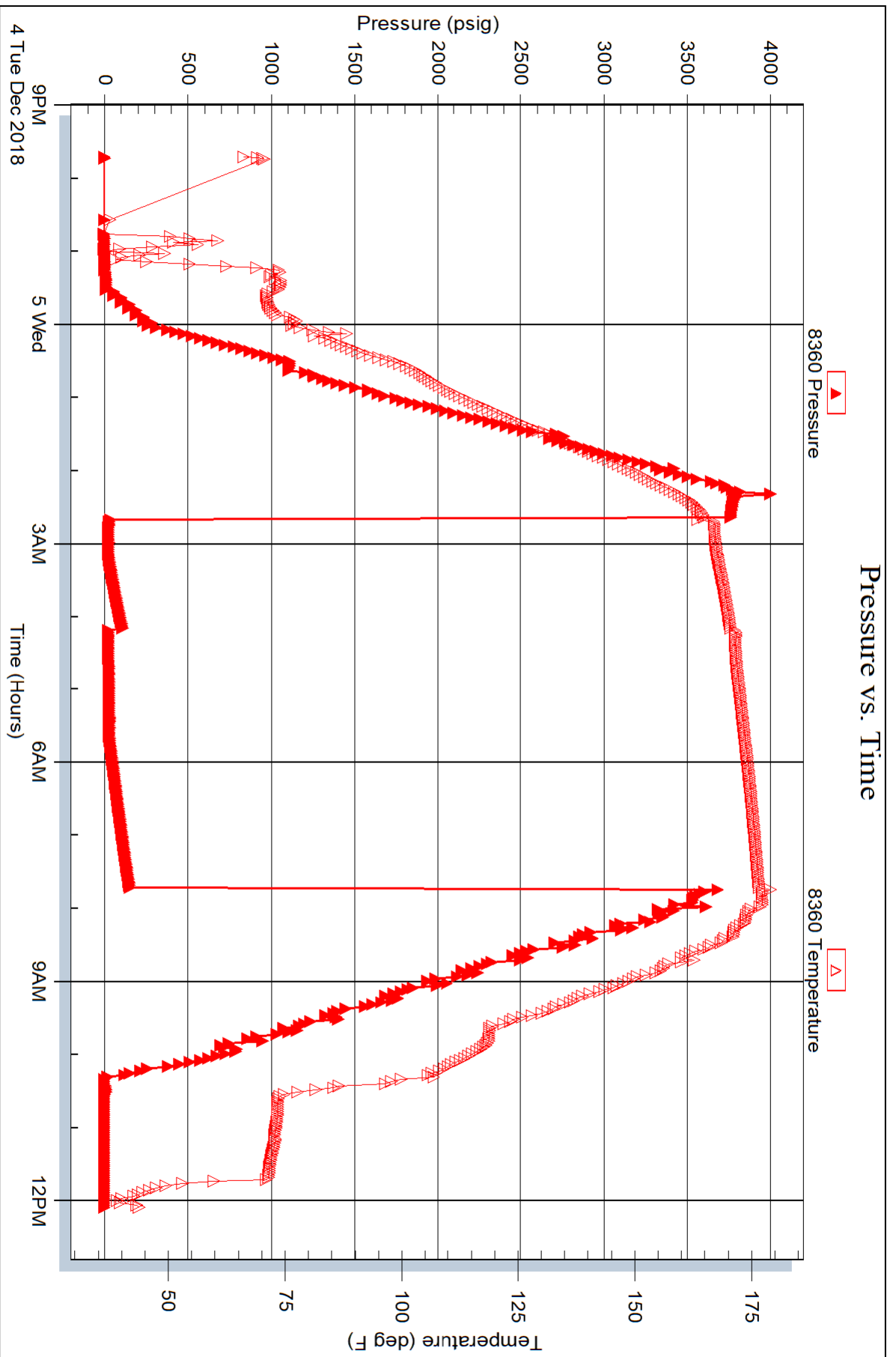
Laboratory Name:

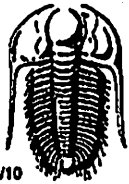
Laboratory Location:

Recovery Comments: Sampler read 0 psi - pulled 3000 ml of mud

### Pressure vs. Time







# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 65379

Well Name & No. Bed Pool #8-21 Test No. 1 Date 12-1-18  
 Company Murkin Drilling Co, Inc. Elevation 5489 KB 5502 GL  
 Address 250 N. Water STE 300 Wichita, KS 67202  
 Co. Rep / Geo. Greg Smith Rig Murkin #25  
 Location: Sec. 2P Twp 10S Rge. 56W Co. Lincoln State Co.

Interval Tested 7376'-7427' Zone Tested Pleasanton  
 Anchor Length 51' Drill Pipe Run 16797.19 Mud Wt. 9.0  
 Top Packer Depth 7371' Drill Collars Run 557.81' Vis 74  
 Bottom Packer Depth 7376' Wt. Pipe Run 0 WL 6.4  
 Total Depth 7427 Chlorides 300 ppm System LCM 20#

Blow Description IFP - Surface blow built to bottom of bucket in 4mins.  
ISI - weak return started 5mins in & built to 1/4" with gas to surface  
FFP - Surface blow built to bottom of bucket in 4mins. with gas to surface  
FST - Return blow built to bottom of the bucket in 28mins

| Rec         | Feet of     | %gas      | %oil      | %water    | %mud      |
|-------------|-------------|-----------|-----------|-----------|-----------|
| <u>279'</u> | <u>GOCM</u> | <u>70</u> | <u>15</u> | <u>15</u> | <u>15</u> |
| <u>93'</u>  | <u>GMC0</u> | <u>15</u> | <u>55</u> | <u>30</u> | <u>30</u> |
| <u>93'</u>  | <u>GOCM</u> | <u>40</u> | <u>30</u> | <u>30</u> | <u>30</u> |
| <u>93'</u>  | <u>GOCM</u> | <u>55</u> | <u>15</u> | <u>30</u> | <u>30</u> |
| <u>114'</u> | <u>GOCM</u> | <u>10</u> | <u>10</u> | <u>80</u> | <u>80</u> |

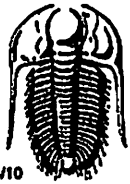
Rec Total 1672' BHT 177°F Gravity \_\_\_\_\_ API RW \_\_\_\_\_ @ \_\_\_\_\_ °F Chlorides \_\_\_\_\_ ppm

(A) Initial Hydrostatic 3815  Test 1850 T-On Location 1:00am  
 (B) First Initial Flow 104  Jars 250 T-Started 4:10am  
 (C) First Final Flow 174  Safety Joint 75 T-Open 9:33am  
 (D) Initial Shut-In 2385  Circ Sub T-Pulled 1:33pm  
 (E) Second Initial Flow 229  Hourly Standby 2 hrs 160 T-Out 8:07pm  
 (F) Second Final Flow 229  Mileage 410 R/T 410 Comments \_\_\_\_\_  
 (G) Final Shut-In 2307  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 31602  Straddle \_\_\_\_\_

Initial Open 30  Shale Packer 250  EM Tool \_\_\_\_\_  
 Initial Shut-In 160  Extra Packer \_\_\_\_\_  Ruined Shale Packer \_\_\_\_\_  
 Final Flow 30  Extra Recorder \_\_\_\_\_  Ruined Packer \_\_\_\_\_  
 Final Shut-In 120  Day Standby \_\_\_\_\_  Extra Copies \_\_\_\_\_  
 Sub Total 2995  Accessibility \_\_\_\_\_ Sub Total 0  
 Total 2995

Approved By \_\_\_\_\_ Our Representative [Signature] MP/DST Disc't \_\_\_\_\_

Trilobite Testing Inc. shall not be liable for damaged of any kind of the property or personnel of the one for whom a test is made, or for any loss suffered or sustained, directly or indirectly, through the use of its equipment, or its statements or opinion concerning the results of any test, tools lost or damaged in the hole shall be paid for at cost by the party for whom the test is made.



# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 65380

Well Name & No. Red Poll #8-21 Test No. 2 Date 12-2-18  
 Company Murfin Drilling Co, Inc. Elevation 5489 KB 5502 GL  
 Address 250 N. Water STE 300 Wichita, KS 67202  
 Co. Rep / Geo. Gregg Smith Rig Murfin #25  
 Location: Sec. 21<sup>00</sup> Twp 10S Rge. 56W Co. Lincoln State Co.

Interval Tested 7428 - 7470 Zone Tested Marmalon C  
 Anchor Length 42' Drill Pipe Run 6871.19' Mud Wt. 9.0  
 Top Packer Depth 7423' Drill Collars Run 557.81' Vis 86  
 Bottom Packer Depth 7428' Wt. Pipe Run 0 WL 7.2  
 Total Depth 7470 Chlorides 800 ppm System LCM 20#

Blow Description IFP - Surface blow built to bottom of bucket in 13 mins w/GTS  
ISI - Return built to 6 3/4" with gas throughout  
FFP - Blow built to bottom of bucket in 12 mins w/GTS  
FST - Return built up to 4"

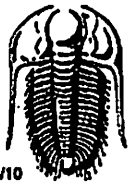
| Rec          | Feet of         | %gas       | %oil       | %water | %mud |
|--------------|-----------------|------------|------------|--------|------|
| <u>1342'</u> | <u>SW</u>       |            | <u>100</u> |        |      |
|              | <u>6027-GIP</u> | <u>100</u> |            |        |      |
|              |                 |            |            |        |      |
|              |                 |            |            |        |      |
|              |                 |            |            |        |      |

Rec Total 1342' BHT 185°F Gravity \_\_\_\_\_ API RW 276@ 19 °F Chlorides 81668 ppm

|                                     |                                                                 |                                                    |
|-------------------------------------|-----------------------------------------------------------------|----------------------------------------------------|
| (A) Initial Hydrostatic <u>3860</u> | <input checked="" type="checkbox"/> Test <u>1850</u>            | T-On Location <u>5:00pm</u>                        |
| (B) First Initial Flow <u>115</u>   | <input checked="" type="checkbox"/> Jars <u>250</u>             | T-Started <u>1:44pm</u>                            |
| (C) First Final Flow <u>450</u>     | <input checked="" type="checkbox"/> Safety Joint <u>75</u>      | T-Open <u>11:40pm</u>                              |
| (D) Initial Shut-In <u>1748</u>     | <input type="checkbox"/> Circ Sub _____                         | T-Pulled <u>3:40am</u>                             |
| (E) Second Initial Flow <u>448</u>  | <input type="checkbox"/> Hourly Standby _____                   | T-Out <u>8:05am</u>                                |
| (F) Second Final Flow <u>621</u>    | <input checked="" type="checkbox"/> Mileage <u>410 RTT</u> 20rt | Comments _____                                     |
| (G) Final Shut-In <u>1753</u>       | <input type="checkbox"/> Sampler _____                          |                                                    |
| (H) Final Hydrostatic <u>3567</u>   | <input type="checkbox"/> Straddle _____                         |                                                    |
|                                     | <input checked="" type="checkbox"/> Shale Packer <u>250</u>     | <input type="checkbox"/> EM Tool _____             |
| Initial Open <u>30</u>              | <input type="checkbox"/> Extra Packer _____                     | <input type="checkbox"/> Ruined Shale Packer _____ |
| Initial Shut-In <u>60</u>           | <input type="checkbox"/> Extra Recorder _____                   | <input type="checkbox"/> Ruined Packer _____       |
| Final Flow <u>30</u>                | <input type="checkbox"/> Day Standby _____                      | Sub Total <u>0</u>                                 |
| Final Shut-In <u>60</u>             | <input type="checkbox"/> Accessibility _____                    | Total <u>2445</u>                                  |

Sub Total 2445 MP/DST Disc't \_\_\_\_\_

Approved By Gregg Smith Our Representative Paul Foster  
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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 65381

Well Name & No. Red Poll #8-21 Test No. 3 Date 12-4-18  
 Company Martin Drilling Co, Inc. Elevation 5489 KB 5502 GL  
 Address 250 N. Water STE 300 Wichita, ks 67202  
 Co. Rep / Geo. Gregg Smith Rig Martin #25  
 Location: Sec. 21 Twp 10S Rge. 56W Co. Lincoln State Co.

Interval Tested 7490-7537' Zone Tested Lower Fort Scott  
 Anchor Length 47' Drill Pipe Run 16922.79 Mud Wt. 9.0  
 Top Packer Depth 7485 Drill Collars Run 557.81 Vis 75  
 Bottom Packer Depth 7490 Wt. Pipe Run 0 WL 7.2  
 Total Depth 7537' Chlorides 800 ppm System LCM 18#

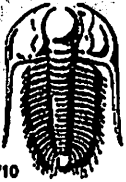
Blow Description IFP - Hit a bridge on the way in the hole, tool  
ISI - opened, tripped back out of the hole to  
FFP - recondition.  
FST - Hit Bridge about 1500'

| Rec | Feet of | %gas | %oil | %water | %mud |
|-----|---------|------|------|--------|------|
|     |         |      |      |        |      |
|     |         |      |      |        |      |
|     |         |      |      |        |      |
|     |         |      |      |        |      |
|     |         |      |      |        |      |

Rec Total \_\_\_\_\_ BHT \_\_\_\_\_ Gravity \_\_\_\_\_ API RW \_\_\_\_\_ @ \_\_\_\_\_ °F Chlorides \_\_\_\_\_ ppm

(A) Initial Hydrostatic \_\_\_\_\_  Test 950 \_\_\_\_\_ T-On Location 3:10am  
 (B) First Initial Flow \_\_\_\_\_  Jars 250 \_\_\_\_\_ T-Started 4:37am  
 (C) First Final Flow \_\_\_\_\_  Safety Joint 75 \_\_\_\_\_ T-Open \_\_\_\_\_  
 (D) Initial Shut-In \_\_\_\_\_  Circ Sub \_\_\_\_\_ T-Pulled \_\_\_\_\_  
 (E) Second Initial Flow \_\_\_\_\_  Hourly Standby \_\_\_\_\_ T-Out 10:00am  
 (F) Second Final Flow \_\_\_\_\_  Mileage 410 R/T 20rt \_\_\_\_\_ Comments \_\_\_\_\_  
 (G) Final Shut-In \_\_\_\_\_  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic \_\_\_\_\_  Straddle \_\_\_\_\_  
 Shale Packer 250 \_\_\_\_\_  EM Tool \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  Ruined Shale Packer \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_  Ruined Packer \_\_\_\_\_  
 Day Standby \_\_\_\_\_ Sub Total 0  
 Accessibility \_\_\_\_\_ Total 1545  
 Sub Total 1545 MP/DST Disc't \_\_\_\_\_

Approved By \_\_\_\_\_ Our Representative \_\_\_\_\_  
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# TRILOBITE TESTING INC.

1515 Commerce Parkway, Bartlesville, Kansas 67601

## Test Ticket

NO. 65382

Well Name & No. Red Poll #8-21 Test No. 4 Date 12-4-18  
 Company Murfin Drilling Co, Inc. Elevation 5489 KB 5502 GL  
 Address 250 N. Water STE 300 Wichita, ks 67202  
 Co. Rep / Geo. Gregg Smith Rig Murfin #25  
 Location: Sec. 21 Twp 10S Rge. 56 W Co. Lincoln State Co.

Interval Tested 7490-7537 Zone Tested Lower Fort Scott  
 Anchor Length 47' Drill Pipe Run 6919.19 Mud Wt. 9.0  
 Top Packer Depth 7485' Drill Collars Run 557.81 Vis 84  
 Bottom Packer Depth 7490' Wt. Pipe Run 0 WL 7.2  
 Total Depth 7537' Chlorides 900 ppm System LCM 20#

Blow Description IFP - Surface blow built up to 1 1/4"  
ISI - No Return  
FFP - Surface blow built up to 1"  
FSI - No Return

| Rec       | Feet of    | %gas | %oil | %water     | %mud |
|-----------|------------|------|------|------------|------|
| <u>5'</u> | <u>Mud</u> |      |      | <u>100</u> |      |
| Rec       | Feet of    | %gas | %oil | %water     | %mud |
| Rec       | Feet of    | %gas | %oil | %water     | %mud |
| Rec       | Feet of    | %gas | %oil | %water     | %mud |
| Rec       | Feet of    | %gas | %oil | %water     | %mud |

Rec Total \_\_\_\_\_ BHT \_\_\_\_\_ Gravity \_\_\_\_\_ API RW \_\_\_\_\_ @ \_\_\_\_\_ °F Chlorides \_\_\_\_\_ ppm

(A) Initial Hydrostatic \_\_\_\_\_  Test 1850 \_\_\_\_\_ T-On Location 8:45pm  
 (B) First Initial Flow 3898 \_\_\_\_\_  Jars 250 \_\_\_\_\_ T-Started 9:42pm  
 (C) First Final Flow 31 \_\_\_\_\_  Safety Joint 75 \_\_\_\_\_ T-Open 2:40am  
 (D) Initial Shut-In 31 \_\_\_\_\_  Circ Sub \_\_\_\_\_ T-Pulled 7:40am  
 (E) Second Initial Flow 105 \_\_\_\_\_  Hourly Standby \_\_\_\_\_ T-Out 12:05pm  
 (F) Second Final Flow 27 \_\_\_\_\_  Mileage 410 B/T 40 \_\_\_\_\_ Comments Picked up tool  
 (G) Final Shut-In 31 \_\_\_\_\_  Sampler 250 \_\_\_\_\_ 12-9-18 @ 1:15am  
 (H) Final Hydrostatic 3724 \_\_\_\_\_  Straddle \_\_\_\_\_  EM Tool \_\_\_\_\_  
 Shale Packer 250 \_\_\_\_\_  Ruined Shale Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  Ruined Packer \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_  Extra Copies \_\_\_\_\_  
 Day Standby 3.5d 13.25h \_\_\_\_\_ Sub Total 2400  
 Accessibility \_\_\_\_\_ Total \_\_\_\_\_  
 Sub Total 2715 MP/DST Disc't \_\_\_\_\_

Approved By Gregg Smith Our Representative [Signature]  
 Trilobite Testing Inc. shall not be liable for damaged of any kind of the property or personnel of the one for whom a test is made, or for any loss suffered or sustained, directly or indirectly, through the use of its equipment, or its statements or opinion concerning the results of any test, tools lost or damaged in the hole shall be paid for at cost by the party for whom the test is made.



# TRILOBITE TESTING, INC.

1515 Commerce Parkway • Hays, Kansas 67601

## FLUID SAMPLER DATA

Ticket No. 65382 Date 12-4-18  
 Company Name Murfin Drilling Co, Inc.  
 Lease Red Poll #8-21 Test No. DST# ~~11~~ 4  
 County Lincoln, Co. Sec. 21 Twp. 10S Rng. 56W

### SAMPLER RECOVERY

Gas \_\_\_\_\_ ML  
 Oil \_\_\_\_\_ ML  
 Mud 3000 ML  
 Water \_\_\_\_\_ ML  
 Other \_\_\_\_\_ ML  
 Pressure Opsi ML  
 Total \_\_\_\_\_ ML

### PIT MUD ANALYSIS

Chlorides \_\_\_\_\_ ppm.  
 Resistivity \_\_\_\_\_ ohms @ \_\_\_\_\_ F  
 Viscosity \_\_\_\_\_  
 Mud Weight \_\_\_\_\_  
 Filtrate \_\_\_\_\_  
 Other \_\_\_\_\_

### SAMPLER ANALYSIS

Resistivity \_\_\_\_\_ ohms @ \_\_\_\_\_ F  
 Chlorides \_\_\_\_\_ ppm.  
 Gravity \_\_\_\_\_ corrected @60F

### PIPE RECOVERY

**TOP**  
 Resistivity \_\_\_\_\_ ohms @ \_\_\_\_\_ F  
 Chlorides \_\_\_\_\_ ppm.

**MIDDLE**  
 Resistivity \_\_\_\_\_ ohms @ \_\_\_\_\_ F  
 Chlorides \_\_\_\_\_ ppm.

**BOTTOM**  
 Resistivity \_\_\_\_\_ ohms @ \_\_\_\_\_ F  
 Chlorides \_\_\_\_\_ ppm.