

## DRILL STEM TEST REPORT

Prepared For: **Bruce Oil Company LLC**

1704 Limestone RD  
McPherson KS 67460+6500

ATTN: Bob Peterson

### **Thornburg #1**

#### **7-8s-14w Osborne,KS**

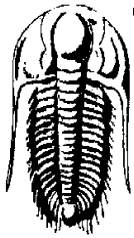
Start Date: 2019.07.15 @ 12:10:00

End Date: 2019.07.15 @ 17:45:39

Job Ticket #: 65799                      DST #: 1

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

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**TRILOBITE**  
**TESTING, INC.**

## DRILL STEM TEST REPORT

Bruce Oil Company LLC

1704 Limestone RD  
McPherson KS 67460+6500

ATTN: Bob Peterson

**7-8s-14w Osborne, KS**

**Thornburg #1**

Job Ticket: 65799

**DST#: 1**

Test Start: 2019.07.15 @ 12:10:00

### GENERAL INFORMATION:

Formation: **Topeka**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 13:44:50

Time Test Ended: 17:45:39

Test Type: Conventional Bottom Hole (Initial)

Tester: Benny Mulligan

Unit No: 66

**Interval: 2758.00 ft (KB) To 2778.00 ft (KB) (TVD)**

Reference Elevations: 1799.00 ft (KB)

Total Depth: 2778.00 ft (KB) (TVD)

1794.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 5.00 ft

**Serial #: 6772 Inside**

Press@RunDepth: 213.24 psig @ 2759.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2019.07.15

End Date:

2019.07.15

Last Calib.: 2019.07.15

Start Time: 12:10:01

End Time:

17:45:40

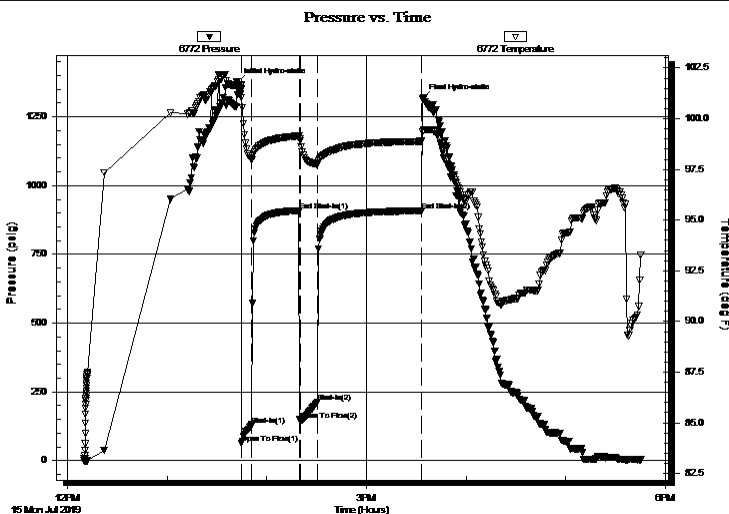
Time On Btm: 2019.07.15 @ 13:42:00

Time Off Btm: 2019.07.15 @ 15:33:50

**TEST COMMENT:** IF-5-BOB 1min 50 secs total build of 40"  
ISI-30- 7" blow back  
FF-10- BOB 2 mins 5 secs total build of 49"  
FSI-60- 13" blow back

### PRESSURE SUMMARY

| Time (Min.) | Pressure (psig) | Temp (deg F) | Annotation           |
|-------------|-----------------|--------------|----------------------|
| 0           | 1375.69         | 101.66       | Initial Hydro-static |
| 3           | 61.87           | 101.05       | Open To Flow (1)     |
| 9           | 129.89          | 97.96        | Shut-In(1)           |
| 38          | 909.01          | 99.17        | End Shut-In(1)       |
| 38          | 147.95          | 98.92        | Open To Flow (2)     |
| 49          | 213.24          | 97.74        | Shut-In(2)           |
| 111         | 908.54          | 98.89        | End Shut-In(2)       |
| 112         | 1315.71         | 99.36        | Final Hydro-static   |



### Recovery

| Length (ft) | Description        | Volume (bbl) |
|-------------|--------------------|--------------|
| 180.00      | GMCO 10%G 5%M 85%O | 0.89         |
| 380.00      | GO 10%O 90%O       | 5.28         |
| 0.00        | GIP 60'            | 0.00         |
|             |                    |              |
|             |                    |              |
|             |                    |              |

### Gas Rates

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



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TESTING, INC.**

## DRILL STEM TEST REPORT

Bruce Oil Company LLC  
1704 Limestone RD  
McPherson KS 67460+6500  
ATTN: Bob Peterson

**7-8s-14w Osborne, KS**  
**Thornburg #1**  
Job Ticket: 65799 **DST#: 1**  
Test Start: 2019.07.15 @ 12:10:00

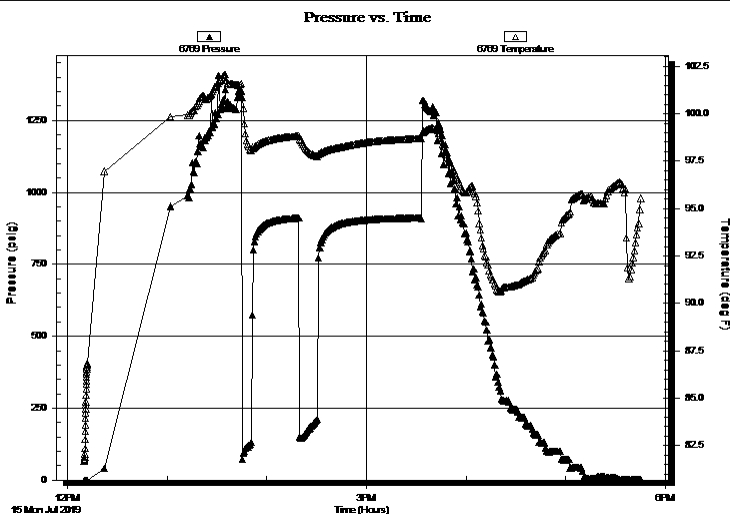
### GENERAL INFORMATION:

Formation: **Topeka**  
Deviated: No Whipstock: ft (KB)  
Time Tool Opened: 13:44:50  
Time Test Ended: 17:45:39  
Interval: **2758.00 ft (KB) To 2778.00 ft (KB) (TVD)**  
Total Depth: 2778.00 ft (KB) (TVD)  
Hole Diameter: 7.88 inches Hole Condition: Fair  
Test Type: Conventional Bottom Hole (Initial)  
Tester: Benny Mulligan  
Unit No: 66  
Reference Elevations: 1799.00 ft (KB)  
1794.00 ft (CF)  
KB to GR/CF: 5.00 ft

### Serial #: 6769 Outside

Press@RunDepth: psig @ 2759.00 ft (KB)  
Start Date: 2019.07.15 End Date: 2019.07.15  
Start Time: 12:10:01 End Time: 17:45:40  
Capacity: 8000.00 psig  
Last Calib.: 2019.07.15  
Time On Btm:  
Time Off Btm:

TEST COMMENT: IF-5-BOB 1min 50 secs total build of 40"  
ISI-30- 7" blow back  
FF-10- BOB 2 mins 5 secs total build of 49"  
FSI-60- 13" blow back



### PRESSURE SUMMARY

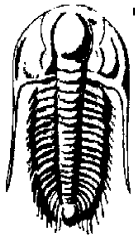
| Time (Min.) | Pressure (psig) | Temp (deg F) | Annotation |
|-------------|-----------------|--------------|------------|
|-------------|-----------------|--------------|------------|

### Recovery

| Length (ft) | Description        | Volume (bbl) |
|-------------|--------------------|--------------|
| 180.00      | GMCO 10%G 5%M 85%O | 0.89         |
| 380.00      | GO 10%O 90%O       | 5.28         |
| 0.00        | GIP 60'            | 0.00         |
|             |                    |              |
|             |                    |              |
|             |                    |              |

### Gas Rates

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



**TRILOBITE**  
**TESTING, INC.**

## DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Bruce Oil Company LLC

**7-8s-14w Osborne, KS**

1704 Limestone RD  
McPherson KS 67460+6500

**Thornburg #1**

Job Ticket: 65799

**DST#: 1**

ATTN: Bob Peterson

Test Start: 2019.07.15 @ 12:10:00

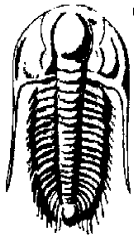
### Tool Information

|                           |                    |                       |                   |                                    |
|---------------------------|--------------------|-----------------------|-------------------|------------------------------------|
| Drill Pipe:               | Length: 2554.00 ft | Diameter: 3.80 inches | Volume: 35.83 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: 185.00 ft  | Diameter: 2.25 inches | Volume: 0.91 bbl  | Weight to Pull Loose: 40000.00 lb  |
|                           |                    | Total Volume:         | 36.74 bbl         | Tool Chased 0.00 ft                |
| Drill Pipe Above KB:      | 8.00 ft            |                       |                   | String Weight: Initial 36000.00 lb |
| Depth to Top Packer:      | 2758.00 ft         |                       |                   | Final 37000.00 lb                  |
| Depth to Bottom Packer:   | ft                 |                       |                   |                                    |
| Interval between Packers: | 20.00 ft           |                       |                   |                                    |
| Tool Length:              | 47.00 ft           |                       |                   |                                    |
| Number of Packers:        | 2                  | Diameter: 6.75 inches |                   |                                    |
| Tool Comments:            |                    |                       |                   |                                    |

| Tool Description | Length (ft) | Serial No. | Position | Depth (ft) | Accum. Lengths |
|------------------|-------------|------------|----------|------------|----------------|
|------------------|-------------|------------|----------|------------|----------------|

|                 |       |      |         |         |                               |
|-----------------|-------|------|---------|---------|-------------------------------|
| Change Over Sub | 1.00  |      |         | 2732.00 |                               |
| Shut In Tool    | 5.00  |      |         | 2737.00 |                               |
| Hydraulic tool  | 5.00  |      |         | 2742.00 |                               |
| Jars            | 5.00  |      |         | 2747.00 |                               |
| Safety Joint    | 2.00  |      |         | 2749.00 |                               |
| Packer          | 5.00  |      |         | 2754.00 | 27.00 Bottom Of Top Packer    |
| Packer          | 4.00  |      |         | 2758.00 |                               |
| Stubb           | 1.00  |      |         | 2759.00 |                               |
| Recorder        | 0.00  | 6772 | Inside  | 2759.00 |                               |
| Recorder        | 0.00  | 6769 | Outside | 2759.00 |                               |
| Perforations    | 16.00 |      |         | 2775.00 |                               |
| Bullnose        | 3.00  |      |         | 2778.00 | 20.00 Bottom Packers & Anchor |

**Total Tool Length: 47.00**



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## DRILL STEM TEST REPORT

### FLUID SUMMARY

Bruce Oil Company LLC

**7-8s-14w Osborne, KS**

1704 Limestone RD  
McPherson KS 67460+6500

**Thornburg #1**

Job Ticket: 65799

**DST#: 1**

ATTN: Bob Peterson

Test Start: 2019.07.15 @ 12:10:00

### Mud and Cushion Information

Mud Type: Gel Chem

Mud Weight: 9.00 lb/gal

Viscosity: 58.00 sec/qt

Water Loss: 7.19 in<sup>3</sup>

Resistivity: ohm.m

Salinity: 4300.00 ppm

Filter Cake: 2.00 inches

Cushion Type:

Cushion Length:

Cushion Volume:

Gas Cushion Type:

Gas Cushion Pressure:

Oil API:

Water Salinity:

30 deg API

ppm

ft

bbl

psig

### Recovery Information

Recovery Table

| Length<br>ft | Description        | Volume<br>bbl |
|--------------|--------------------|---------------|
| 180.00       | GMCO 10%G 5%M 85%O | 0.885         |
| 380.00       | GO 10%O 90%O       | 5.285         |
| 0.00         | GIP 60'            | 0.000         |

Total Length: 560.00 ft

Total Volume: 6.170 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

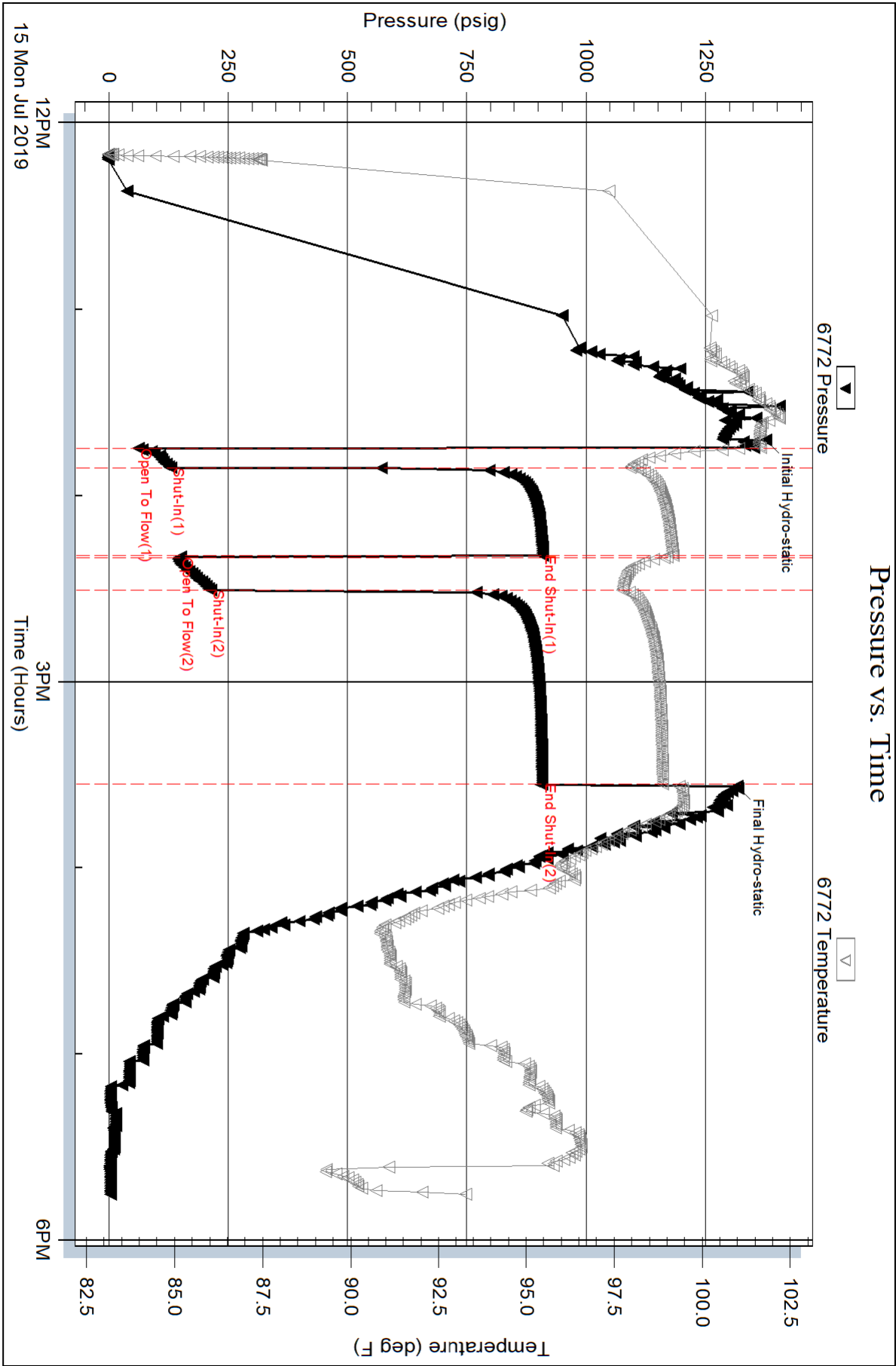
Serial #: 6772

Inside

Bruce Oil Company LLC

Thornburg #1

DST Test Number: 1



Serial #: 6769

Outside

Bruce Oil Company LLC

Thornburg #1

DST Test Number: 1





# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket 65799

NO.

Well Name & No. Thornburg #1 Test No. DST 1 Date 7/15/2019  
 Company Bruce Oil Company LLC Elevation 1799 KB 1794 GL  
 Address 1704 Limestone RD Mepherston KS 67460+6500  
 Co. Rep / Geo. Bob Peterson Rig Murfin 8  
 Location: Sec. 7 Twp 8S Rge. 14W Co. Osborne State KS

Interval Tested 2758~2778 Zone Tested Topeka A  
 Anchor Length 20' Drill Pipe Run 2554 Mud Wt. 8.9  
 Top Packer Depth 2753 Drill Collars Run 185 Vis 58  
 Bottom Packer Depth 2758 Wt. Pipe Run        WL 7.2  
 Total Depth 2778 Chlorides 4300 ppm System LCM 2#

Blow Description IF-BOB 1min 50secs total build of 40"  
FSI- 7" blow back  
FF-BOB 2mins 5secs total build of 49"  
FSI- 13" blow back

| Rec         | Feet of         | %gas      | %oil      | %water | %mud     |
|-------------|-----------------|-----------|-----------|--------|----------|
| <u>380'</u> | <u>G.O.</u>     | <u>10</u> | <u>90</u> |        |          |
| <u>180'</u> | <u>Gm-Cr O.</u> | <u>10</u> | <u>85</u> |        | <u>5</u> |
| <u>0</u>    | <u>GIP 60'</u>  |           |           |        |          |
|             |                 |           |           |        |          |
|             |                 |           |           |        |          |

Rec Total 560' BHT 99 Gravity        API RW        @        °F Chlorides        ppm

|                                     |                                                                      |                               |
|-------------------------------------|----------------------------------------------------------------------|-------------------------------|
| (A) Initial Hydrostatic <u>1375</u> | <input checked="" type="checkbox"/> Test <u>1200</u>                 | T-On Location <u>11:20 AM</u> |
| (B) First Initial Flow <u>61</u>    | <input checked="" type="checkbox"/> Jars <u>250</u>                  | T-Started <u>12:10 PM</u>     |
| (C) First Final Flow <u>129</u>     | <input checked="" type="checkbox"/> Safety Joint <u>75</u>           | T-Open <u>1:45</u>            |
| (D) Initial Shut-In <u>909</u>      | <input type="checkbox"/> Circ Sub <u>      </u>                      | T-Pulled <u>3:30</u>          |
| (E) Second Initial Flow <u>147</u>  | <input type="checkbox"/> Hourly Standby <u>      </u>                | T-Out <u>5:46</u>             |
| (F) Second Final Flow <u>213</u>    | <input checked="" type="checkbox"/> Mileage <u>122 RT</u> <u>122</u> | Comments <u>Looked for 1</u>  |
| (G) Final Shut-In <u>908</u>        | <input type="checkbox"/> Sampler <u>      </u>                       | <u>after DST 1</u>            |
| (H) Final Hydrostatic <u>1315</u>   | <input type="checkbox"/> Straddle <u>      </u>                      |                               |

|                           |                                                       |                                                            |
|---------------------------|-------------------------------------------------------|------------------------------------------------------------|
| Initial Open <u>5</u>     | <input type="checkbox"/> Shale Packer <u>      </u>   | <input type="checkbox"/> EM Tool <u>      </u>             |
| Initial Shut-In <u>30</u> | <input type="checkbox"/> Extra Packer <u>      </u>   | <input type="checkbox"/> Ruined Shale Packer <u>      </u> |
| Final Flow <u>10</u>      | <input type="checkbox"/> Extra Recorder <u>      </u> | <input type="checkbox"/> Ruined Packer <u>      </u>       |
| Final Shut-In <u>60</u>   | <input type="checkbox"/> Day Standby <u>      </u>    | <input type="checkbox"/> Extra Copies <u>      </u>        |
|                           | <input type="checkbox"/> Accessibility <u>      </u>  | Sub Total <u>0</u>                                         |
|                           | Sub Total <u>1647</u>                                 | Total <u>1647</u>                                          |

Approved By        Our Representative Benny Mulligan

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.