



DRILL STEM TEST REPORT

Prepared For: **Downing-Nelson Oil Co., Inc.**

PO Box 1019
Hays, KS 67601

ATTN: Marc Downing

Ruder #1-31

31-14S-18W Ellis,KS

Start Date: 2019.02.05 @ 20:20:23

End Date: 2019.02.06 @ 03:17:14

Job Ticket #: 65513 DST #: 1

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

Printed: 2019.02.11 @ 09:43:10



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Dow ning-Nelson Oil Co., Inc.

31-14S-18W Ellis,KS

PO Box 1019
Hays, KS 67601

Ruder #1-31

Job Ticket: 65513

DST#: 1

ATTN: Marc Dow ning

Test Start: 2019.02.05 @ 20:20:23

GENERAL INFORMATION:

Formation: **LKC "C"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 23:50:44

Time Test Ended: 03:17:14

Test Type: Conventional Bottom Hole (Initial)

Tester: Brannan Lonsdale

Unit No: 73

Interval: 3394.00 ft (KB) To 3424.00 ft (KB) (TVD)

Reference Elevations: 2076.00 ft (KB)

Total Depth: 3424.00 ft (KB) (TVD)

2068.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 8.00 ft

Serial #: 8700 Outside

Press@RunDepth: 11.35 psig @ 3395.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2019.02.05

End Date:

2019.02.06

Last Calib.:

2019.02.06

Start Time:

20:20:24

End Time:

03:17:14

Time On Btm:

2019.02.05 @ 23:50:29

Time Off Btm:

2019.02.06 @ 01:51:29

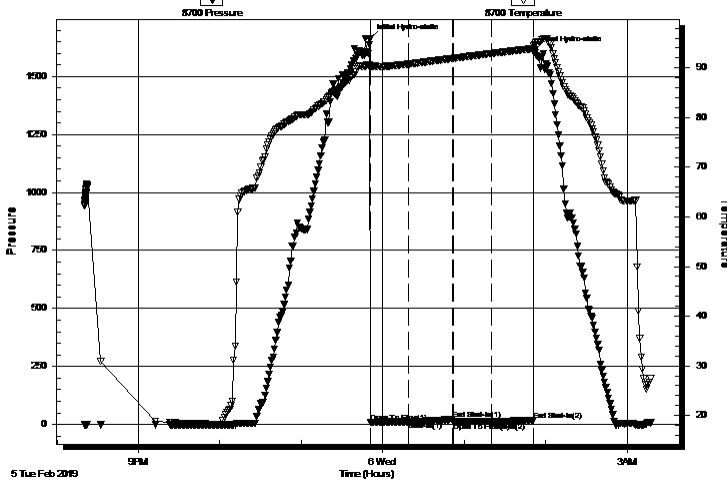
TEST COMMENT: 30- IF- Slow ly built to 0.97"

30- IS- No blow

30- FF- Very weak surface blow

30- FSI- No blow

Pressure vs. Time



PRESSURE SUMMARY

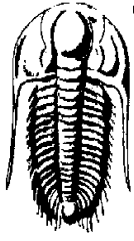
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1661.72	90.59	Initial Hydro-static
1	10.09	90.14	Open To Flow (1)
29	11.65	90.78	Shut-In(1)
61	21.78	91.91	End Shut-In(1)
62	11.33	91.93	Open To Flow (2)
90	11.35	92.90	Shut-In(2)
121	17.56	93.89	End Shut-In(2)
121	1613.20	94.74	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
2.00	M	0.01

Gas Rates

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



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Dow ning-Nelson Oil Co., Inc.

31-14S-18W Ellis,KS

PO Box 1019
Hays, KS 67601

Ruder #1-31

Job Ticket: 65513

DST#: 1

ATTN: Marc Dow ning

Test Start: 2019.02.05 @ 20:20:23

GENERAL INFORMATION:

Formation: **LKC "C"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 23:50:44

Time Test Ended: 03:17:14

Interval: **3394.00 ft (KB) To 3424.00 ft (KB) (TVD)**

Total Depth: 3424.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Fair

Test Type: Conventional Bottom Hole (Initial)

Tester: Brannan Lonsdale

Unit No: 73

Reference Elevations: 2076.00 ft (KB)

2068.00 ft (CF)

KB to GR/CF: 8.00 ft

Serial #: 6771

Inside

Press@RunDepth: psig @ 3395.00 ft (KB)

Start Date: 2019.02.05

End Date:

2019.02.06

Start Time: 20:20:26

End Time:

03:17:01

Capacity: 8000.00 psig

Last Calib.:

2019.02.06

Time On Btm:

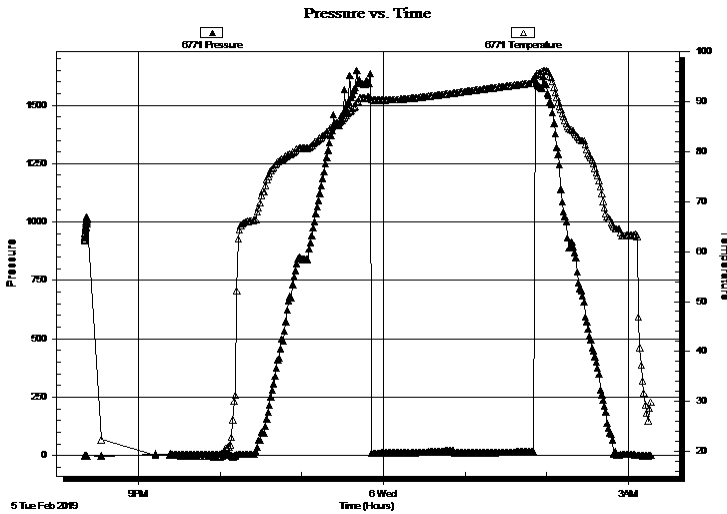
Time Off Btm:

TEST COMMENT: 30- IF- Slow ly built to 0.97"

30- IS- No blow

30- FF- Very w eak surface blow

30- FS- No blow



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
2.00	M	0.01

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Dow ning-Nelson Oil Co., Inc.

31-14S-18W Ellis,KS

PO Box 1019
Hays, KS 67601

Ruder #1-31

Job Ticket: 65513

DST#: 1

ATTN: Marc Dow ning

Test Start: 2019.02.05 @ 20:20:23

Tool Information

Drill Pipe:	Length: 3361.00 ft	Diameter: 3.82 inches	Volume: 47.64 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 32.00 ft	Diameter: 2.25 inches	Volume: 0.16 bbl	Weight to Pull Loose: 47000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	19.00 ft			String Weight: Initial 47000.00 lb
Depth to Top Packer:	3394.00 ft			Final 47000.00 lb
Depth to Bottom Packer:	ft			
Interval betw een Packers:	30.00 ft			
Tool Length:	50.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			3375.00	
Shut In Tool	5.00			3380.00	
Hydraulic tool	5.00			3385.00	
Packer	5.00			3390.00	20.00 Bottom Of Top Packer
Packer	4.00			3394.00	
Stubb	1.00			3395.00	
Recorder	0.00	6771	Inside	3395.00	
Recorder	0.00	8700	Outside	3395.00	
Perforations	26.00			3421.00	
Bullnose	3.00			3424.00	30.00 Bottom Packers & Anchor
Total Tool Length:	50.00				



**TRILOBITE
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DRILL STEM TEST REPORT

FLUID SUMMARY

Dow ning-Nelson Oil Co., Inc.

31-14S-18W Ellis,KS

PO Box 1019
Hays, KS 67601

Ruder #1-31

Job Ticket: 65513

DST#: 1

ATTN: Marc Dow ning

Test Start: 2019.02.05 @ 20:20:23

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: 51.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.58 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 18000.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
2.00	M	0.010

Total Length: 2.00 ft Total Volume: 0.010 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

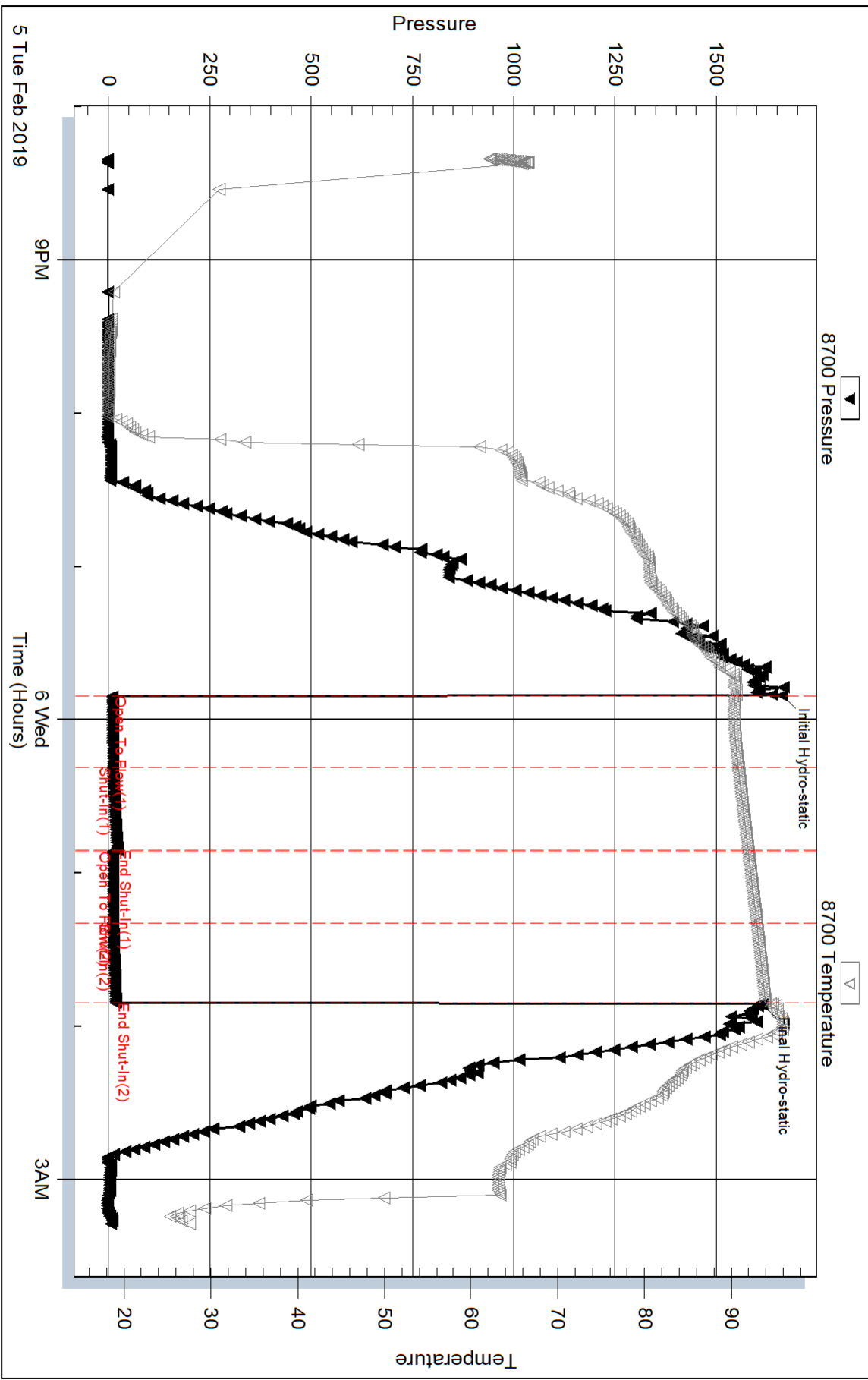
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

Pressure vs. Time



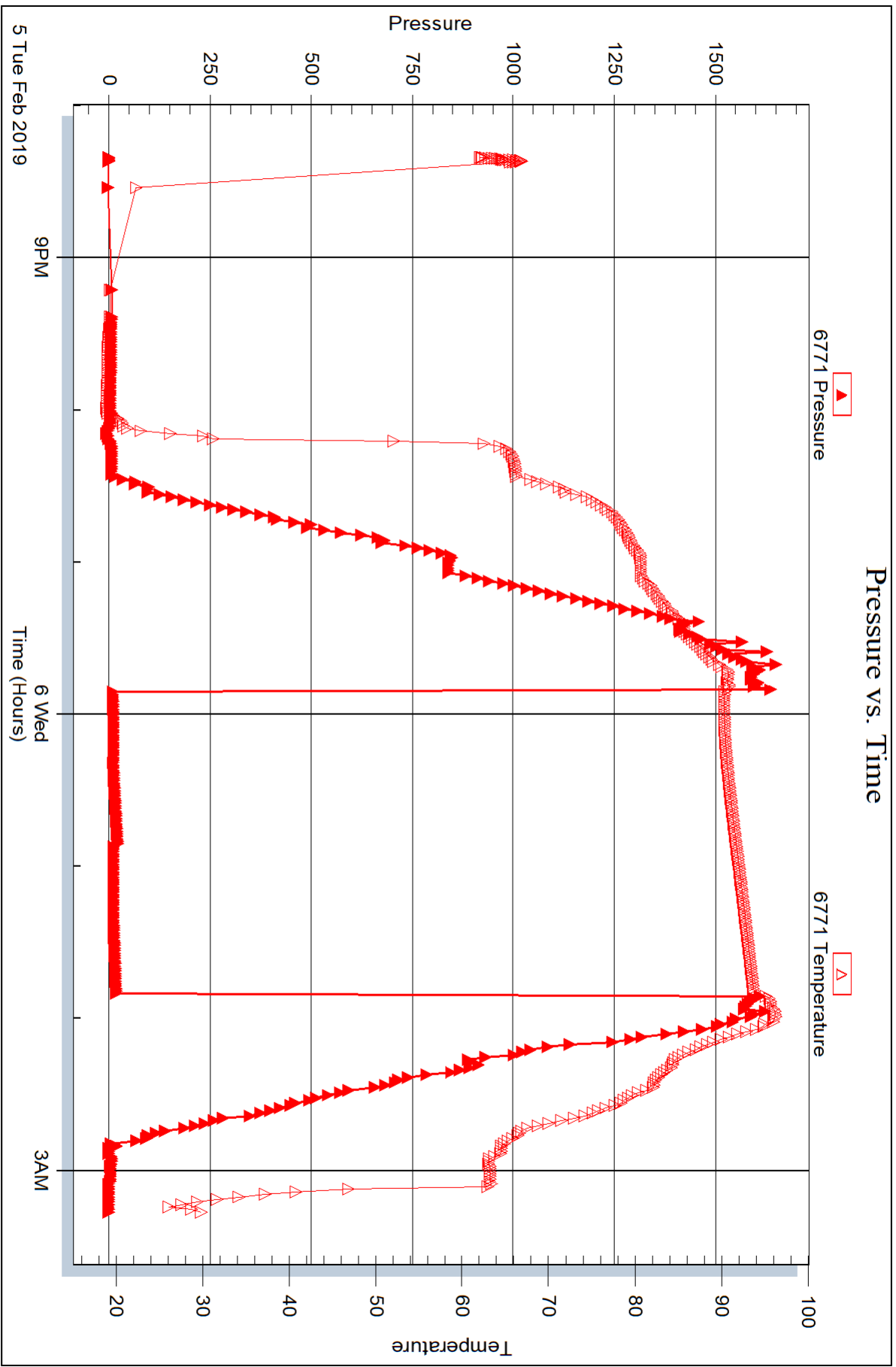
Serial #: 6771

Inside

Dow nting-Nelson Oil Co., Inc.

Ruder #1-31

DST Test Number: 1



Triobite Testing, Inc

Ref. No: 65513

Printed: 2019.02.11 @ 09:43:11



DRILL STEM TEST REPORT

Prepared For: **Downing-Nelson Oil Co., Inc.**

PO Box 1019
Hays, KS 67601

ATTN: Marc Downing

Ruder #1-31

31-14S-18W Ellis,KS

Start Date: 2019.02.06 @ 09:25:24

End Date: 2019.02.06 @ 16:44:00

Job Ticket #: 65514 DST #: 2

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

Printed: 2019.02.11 @ 09:42:48



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Dow ning-Nelson Oil Co., Inc.

31-14S-18W Ellis,KS

PO Box 1019
Hays, KS 67601

Ruder #1-31

Job Ticket: 65514

DST#: 2

ATTN: Marc Dow ning

Test Start: 2019.02.06 @ 09:25:24

GENERAL INFORMATION:

Formation: **LKC "D"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 11:39:45

Time Test Ended: 16:44:00

Test Type: Conventional Bottom Hole (Reset)

Tester: Brannan Lonsdale

Unit No: 73

Interval: 3421.00 ft (KB) To 3443.00 ft (KB) (TVD)

Reference Elevations: 2076.00 ft (KB)

Total Depth: 3443.00 ft (KB) (TVD)

2068.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 8.00 ft

Serial #: 8700

Outside

Press@RunDepth: 103.16 psig @ 3422.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2019.02.06

End Date:

2019.02.06

Last Calib.:

2019.02.06

Start Time:

09:25:25

End Time:

16:44:00

Time On Btm:

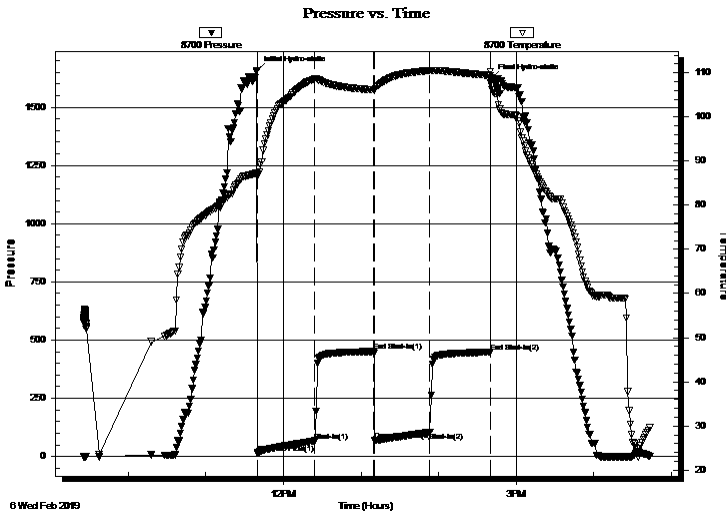
2019.02.06 @ 11:39:30

Time Off Btm:

2019.02.06 @ 14:41:00

TEST COMMENT: 45- IF- Slow ly built to 11.13"
45- IS- No blow
45- FF- Slow ly built to 7.75"
45- FS- No blow

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1658.09	87.38	Initial Hydro-static
1	13.76	86.77	Open To Flow (1)
45	66.36	108.63	Shut-In(1)
91	450.55	106.11	End Shut-In(1)
91	67.83	106.06	Open To Flow (2)
134	103.16	110.49	Shut-In(2)
181	447.46	109.38	End Shut-In(2)
182	1624.68	106.95	Final Hydro-static

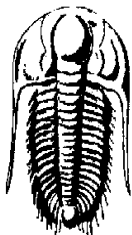
Recovery

Length (ft)	Description	Volume (bbl)
180.00	MW, 10%M 90%W	2.26

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

Dow ning-Nelson Oil Co., Inc.

31-14S-18W Ellis,KS

PO Box 1019
Hays, KS 67601

Ruder #1-31

Job Ticket: 65514

DST#: 2

ATTN: Marc Dow ning

Test Start: 2019.02.06 @ 09:25:24

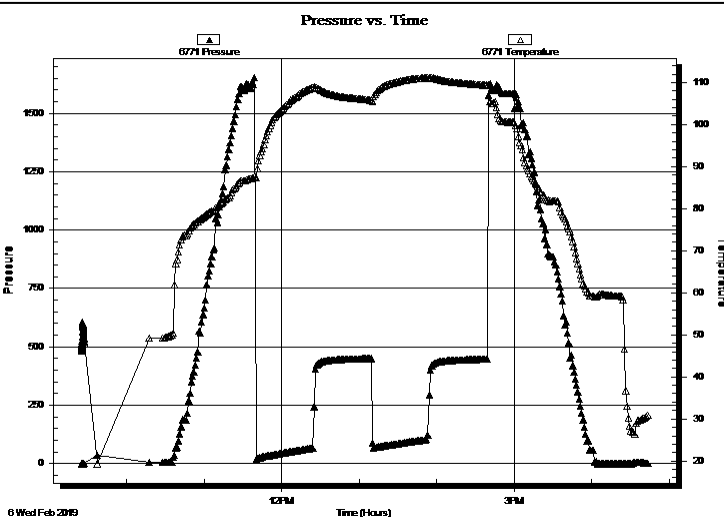
GENERAL INFORMATION:

Formation: LKC "D"			
Deviated: No Whipstock:	ft (KB)	Test Type: Conventional Bottom Hole (Reset)	
Time Tool Opened: 11:39:45		Tester: Brannan Lonsdale	
Time Test Ended: 16:44:00		Unit No: 73	
Interval: 3421.00 ft (KB) To 3443.00 ft (KB) (TVD)		Reference Elevations: 2076.00 ft (KB)	
Total Depth: 3443.00 ft (KB) (TVD)		2068.00 ft (CF)	
Hole Diameter: 7.88 inches	Hole Condition: Fair	KB to GR/CF: 8.00 ft	

Serial #: 6771 Inside

Press@RunDepth: psig @ 3422.00 ft (KB)	Capacity: 8000.00 psig	
Start Date: 2019.02.06	End Date: 2019.02.06	Last Calib.: 2019.02.06
Start Time: 09:25:22	End Time: 16:43:57	Time On Btm:
		Time Off Btm:

TEST COMMENT:
 45- IF- Slow ly built to 11.13"
 45- IS- No blow
 45- FF- Slow ly built to 7.75"
 45- FS- No blow



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
180.00	MW, 10%M 90%W	2.26

Gas Rates

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

* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Dow ning-Nelson Oil Co., Inc.

31-14S-18W Ellis,KS

PO Box 1019
Hays, KS 67601

Ruder #1-31

Job Ticket: 65514

DST#: 2

ATTN: Marc Dow ning

Test Start: 2019.02.06 @ 09:25:24

Tool Information

Drill Pipe:	Length: 3392.00 ft	Diameter: 3.82 inches	Volume: 48.08 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 32.00 ft	Diameter: 2.25 inches	Volume: 0.16 bbl	Weight to Pull Loose: 54000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	23.00 ft			String Weight: Initial 44000.00 lb
Depth to Top Packer:	3421.00 ft			Final 46000.00 lb
Depth to Bottom Packer:	ft			
Interval betw een Packers:	22.00 ft			
Tool Length:	42.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
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Change Over Sub	1.00			3402.00	
Shut In Tool	5.00			3407.00	
Hydraulic tool	5.00			3412.00	
Packer	5.00			3417.00	20.00 Bottom Of Top Packer
Packer	4.00			3421.00	
Stubb	1.00			3422.00	
Recorder	0.00	6771	Inside	3422.00	
Recorder	0.00	8700	Outside	3422.00	
Perforations	18.00			3440.00	
Bullnose	3.00			3443.00	22.00 Bottom Packers & Anchor
Total Tool Length:	42.00				



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Dow ning-Nelson Oil Co., Inc.

31-14S-18W Ellis,KS

PO Box 1019
Hays, KS 67601

Ruder #1-31

Job Ticket: 65514

DST#: 2

ATTN: Marc Dow ning

Test Start: 2019.02.06 @ 09:25:24

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:

62500 ppm

Viscosity: 52.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.58 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 7000.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
180.00	MW, 10%M 90%W	2.255

Total Length: 180.00 ft Total Volume: 2.255 bbl

Num Fluid Samples: 0

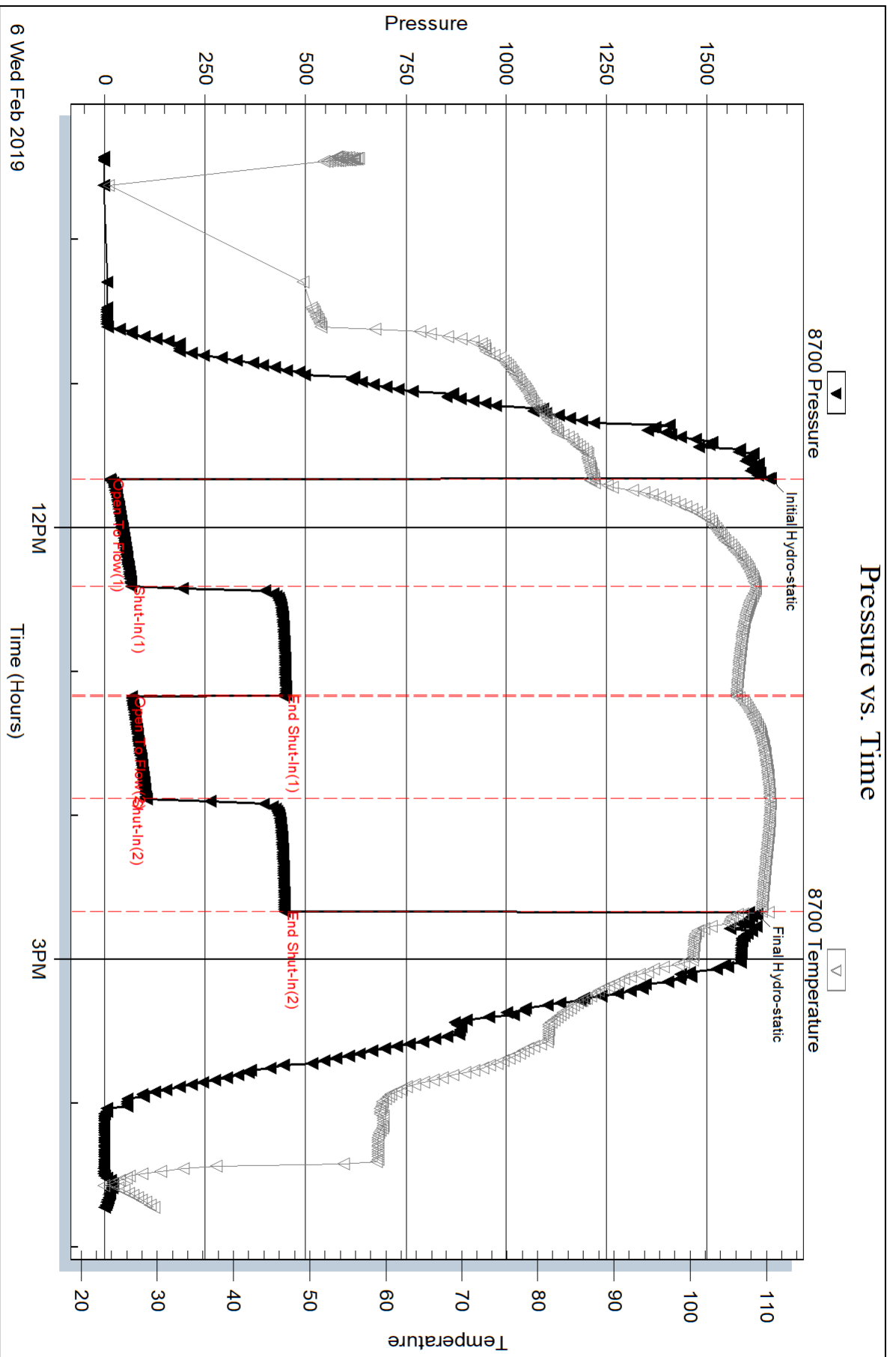
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: RW: .13@37deg



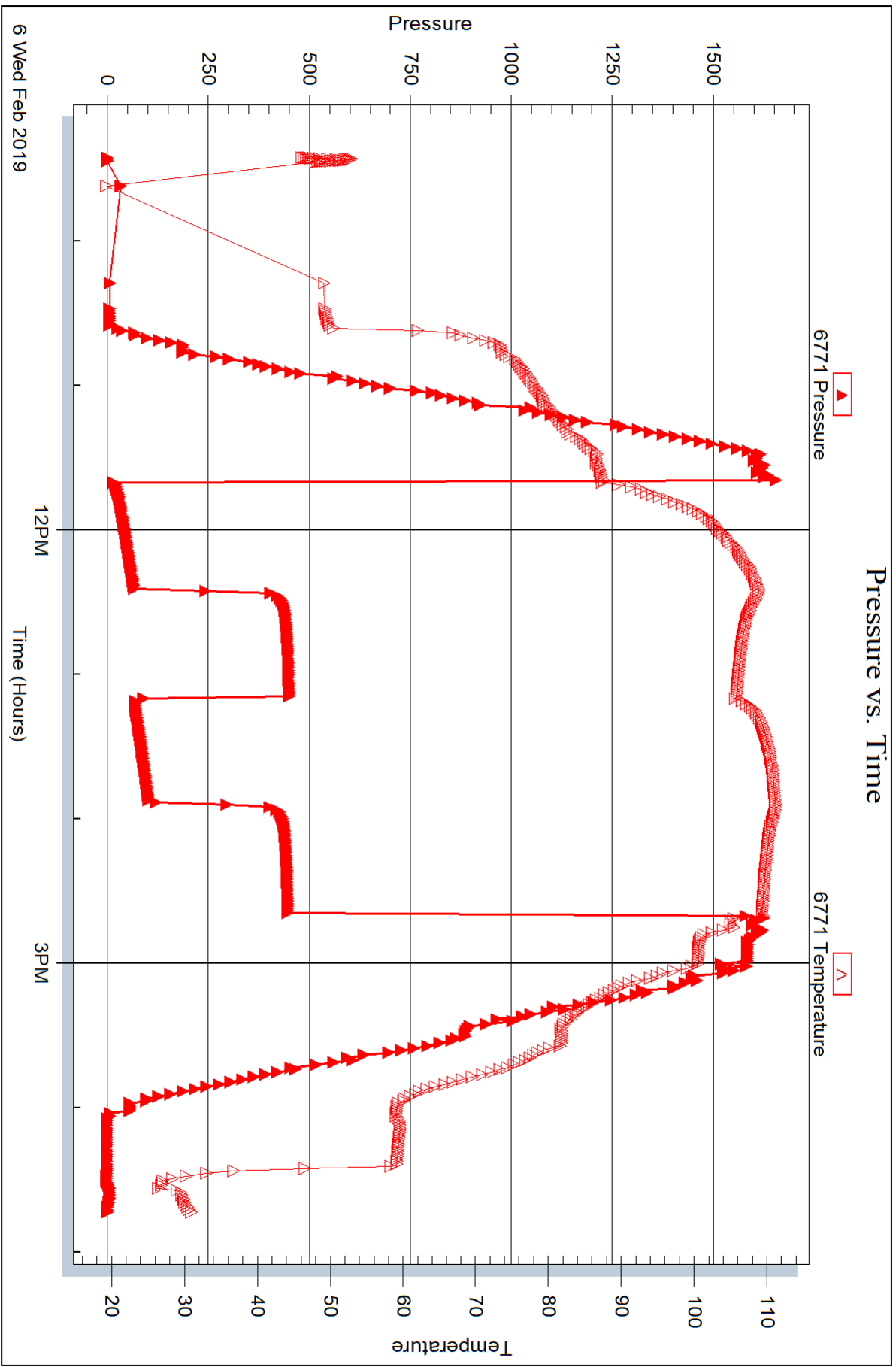
Serial #: 6771

Inside

Dow nting-Nelson Oil Co., Inc.

Ruder #1-31

DST Test Number: 2



Triobite Testing, Inc

Ref. No: 65514

Printed: 2019.02.11 @ 09:42:49



DRILL STEM TEST REPORT

Prepared For: **Downing-Nelson Oil Co., Inc.**

PO Box 1019
Hays, KS 67601

ATTN: Marc Downing

Ruder #1-31

31-14S-18W Ellis,KS

Start Date: 2019.02.07 @ 06:38:48

End Date: 2019.02.07 @ 12:59:54

Job Ticket #: 65515 DST #: 3

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

Printed: 2019.02.11 @ 09:42:25

Downing-Nelson Oil Co., Inc.
31-14S-18W Ellis,KS
Ruder #1-31
DST # 3
LKC "H - I"
2019.02.07



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Dow ning-Nelson Oil Co., Inc.

31-14S-18W Ellis,KS

PO Box 1019
Hays, KS 67601

Ruder #1-31

Job Ticket: 65515

DST#: 3

ATTN: Marc Dow ning

Test Start: 2019.02.07 @ 06:38:48

GENERAL INFORMATION:

Formation: **LKC "H - I"**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 09:09:39
 Time Test Ended: 12:59:54
 Interval: **3508.00 ft (KB) To 3559.00 ft (KB) (TVD)**
 Total Depth: 3559.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Brannan Lonsdale
 Unit No: 73
 Reference Elevations: 2076.00 ft (KB)
 2068.00 ft (CF)
 KB to GR/CF: 8.00 ft

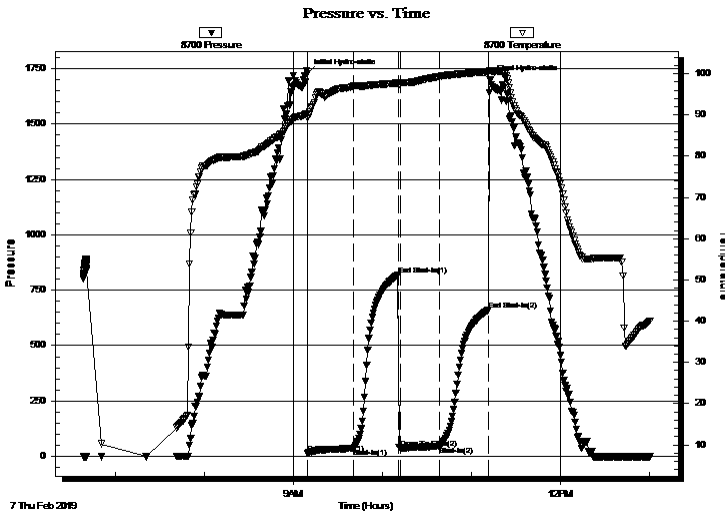
Serial #: 8700

Outside

Press@RunDepth: 46.38 psig @ 3509.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2019.02.07 End Date: 2019.02.07 Last Calib.: 2019.02.07
 Start Time: 06:38:49 End Time: 12:59:54 Time On Btm: 2019.02.07 @ 09:09:24
 Time Off Btm: 2019.02.07 @ 11:12:24

TEST COMMENT: 30- IF- Slow ly built to 1.56" in 6 mins then slow ly died back to 0.82"
 30- IS- No blow
 30- FF- Slow ly built to 1.44"
 30- FS- No blow

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1727.59	90.37	Initial Hydro-static
1	15.14	89.28	Open To Flow (1)
32	36.68	97.07	Shut-In(1)
62	819.97	97.73	End Shut-In(1)
63	37.02	97.84	Open To Flow (2)
90	46.38	99.38	Shut-In(2)
122	659.59	100.42	End Shut-In(2)
123	1701.01	100.73	Final Hydro-static

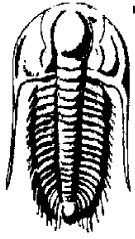
Recovery

Length (ft)	Description	Volume (bbl)
65.00	WSOCM, 5%O 20%W 75%M	0.63
5.00	CO	0.07

* Recovery from multiple tests

Gas Rates

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



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Dow ning-Nelson Oil Co., Inc.

31-14S-18W Ellis, KS

PO Box 1019
Hays, KS 67601

Ruder #1-31

Job Ticket: 65515

DST#: 3

ATTN: Marc Dow ning

Test Start: 2019.02.07 @ 06:38:48

GENERAL INFORMATION:

Formation: **LKC "H - I"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 09:09:39

Time Test Ended: 12:59:54

Test Type: Conventional Bottom Hole (Reset)

Tester: Brannan Lonsdale

Unit No: 73

Interval: 3508.00 ft (KB) To 3559.00 ft (KB) (TVD)

Total Depth: 3559.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Fair

Reference Elevations: 2076.00 ft (KB)

2068.00 ft (CF)

KB to GR/CF: 8.00 ft

Serial #: 6771 Inside

Press@RunDepth: psig @ 3509.00 ft (KB)

Start Date: 2019.02.07 End Date: 2019.02.07

Start Time: 06:38:31 End Time: 12:59:21

Capacity: 8000.00 psig

Last Calib.: 2019.02.07

Time On Btm:

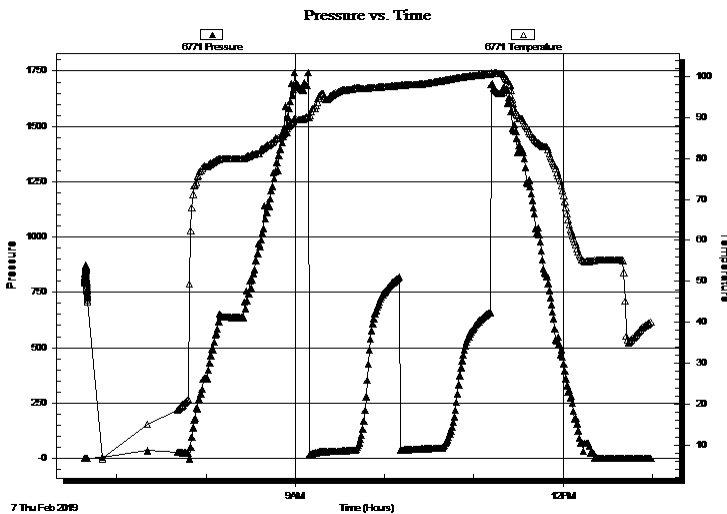
Time Off Btm:

TEST COMMENT: 30- IF- Slow ly built to 1.56" in 6 mins then slow ly died back to 0.82"

30- IS- No blow

30- FF- Slow ly built to 1.44"

30- FS- No blow



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
65.00	WSOCM, 5%O 20%W 75%M	0.63
5.00	CO	0.07

* Recovery from multiple tests

Gas Rates

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



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Dow ning-Nelson Oil Co., Inc.

31-14S-18W Ellis,KS

PO Box 1019
Hays, KS 67601

Ruder #1-31

Job Ticket: 65515

DST#: 3

ATTN: Marc Dow ning

Test Start: 2019.02.07 @ 06:38:48

Tool Information

Drill Pipe:	Length: 3488.00 ft	Diameter: 3.82 inches	Volume: 49.44 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 32.00 ft	Diameter: 2.25 inches	Volume: 0.16 bbl	Weight to Pull Loose: 55000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	32.00 ft			String Weight: Initial 47000.00 lb
Depth to Top Packer:	3508.00 ft			Final 47000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	51.00 ft			
Tool Length:	71.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			3489.00	
Shut In Tool	5.00			3494.00	
Hydraulic tool	5.00			3499.00	
Packer	5.00			3504.00	20.00 Bottom Of Top Packer
Packer	4.00			3508.00	
Stubb	1.00			3509.00	
Recorder	0.00	6771	Inside	3509.00	
Recorder	0.00	8700	Outside	3509.00	
Perforations	13.00			3522.00	
Change Over Sub	1.00			3523.00	
Drill Pipe	32.00			3555.00	
Change Over Sub	1.00			3556.00	
Bullnose	3.00			3559.00	51.00 Bottom Packers & Anchor

Total Tool Length: 71.00



TRILOBITE
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DRILL STEM TEST REPORT

FLUID SUMMARY

Downing-Nelson Oil Co., Inc.

31-14S-18W Ellis,KS

PO Box 1019
Hays, KS 67601

Ruder #1-31

Job Ticket: 65515

DST#: 3

ATTN: Marc Downing

Test Start: 2019.02.07 @ 06:38:48

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

36 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

55000 ppm

Viscosity: 52.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.58 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 7000.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
65.00	WSOCM, 5%O 20%W 75%M	0.625
5.00	CO	0.071

Total Length: 70.00 ft Total Volume: 0.696 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

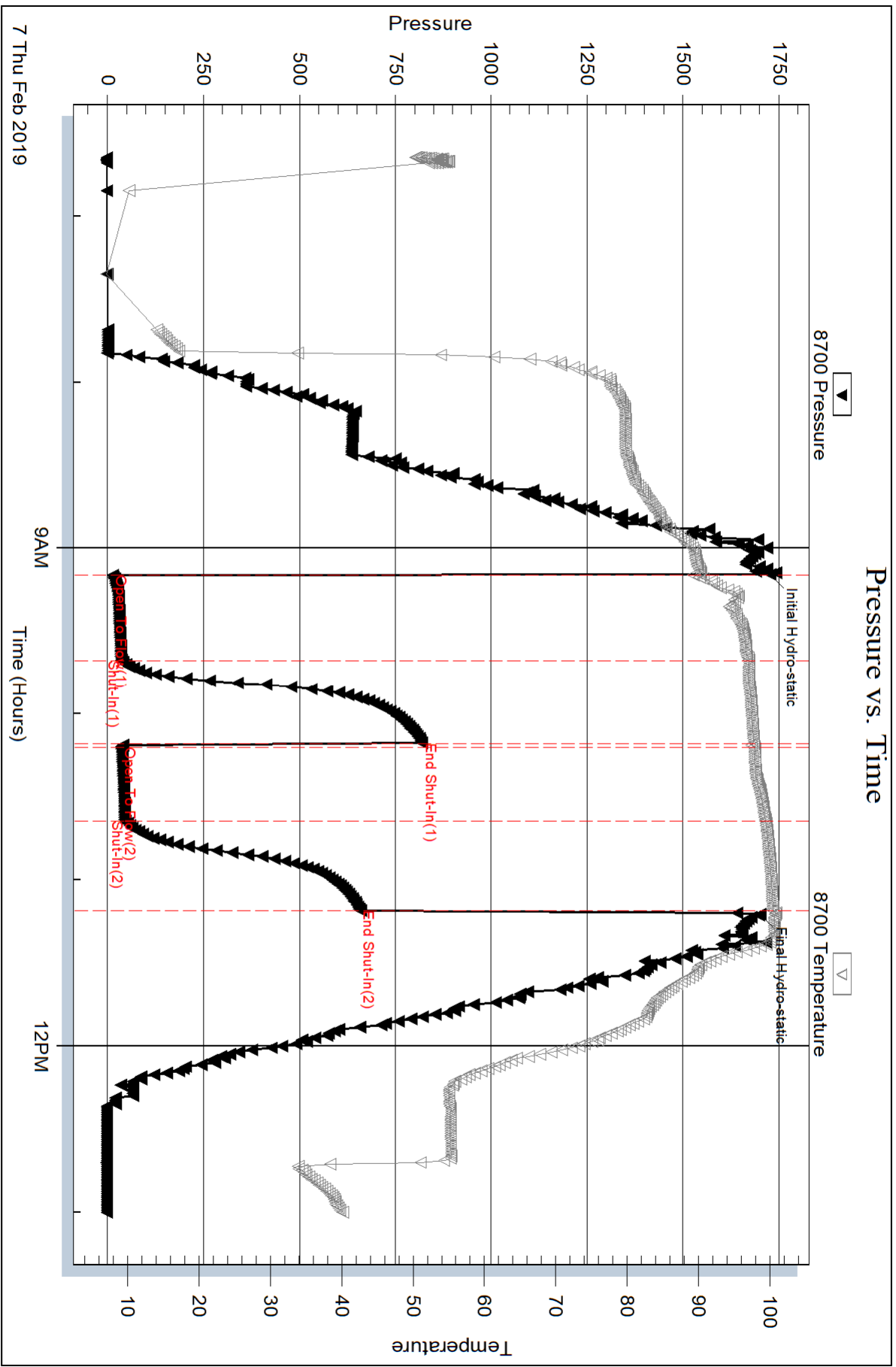
Recovery Comments: RW: .21@41deg

Serial #: 8700

Outside Dow nting-Nelson Oil Co., Inc.

Ruder #1-31

DST Test Number: 3



Trilobite Testing, Inc

Ref. No: 65515

Printed: 2019.02.11 @ 09:42:26

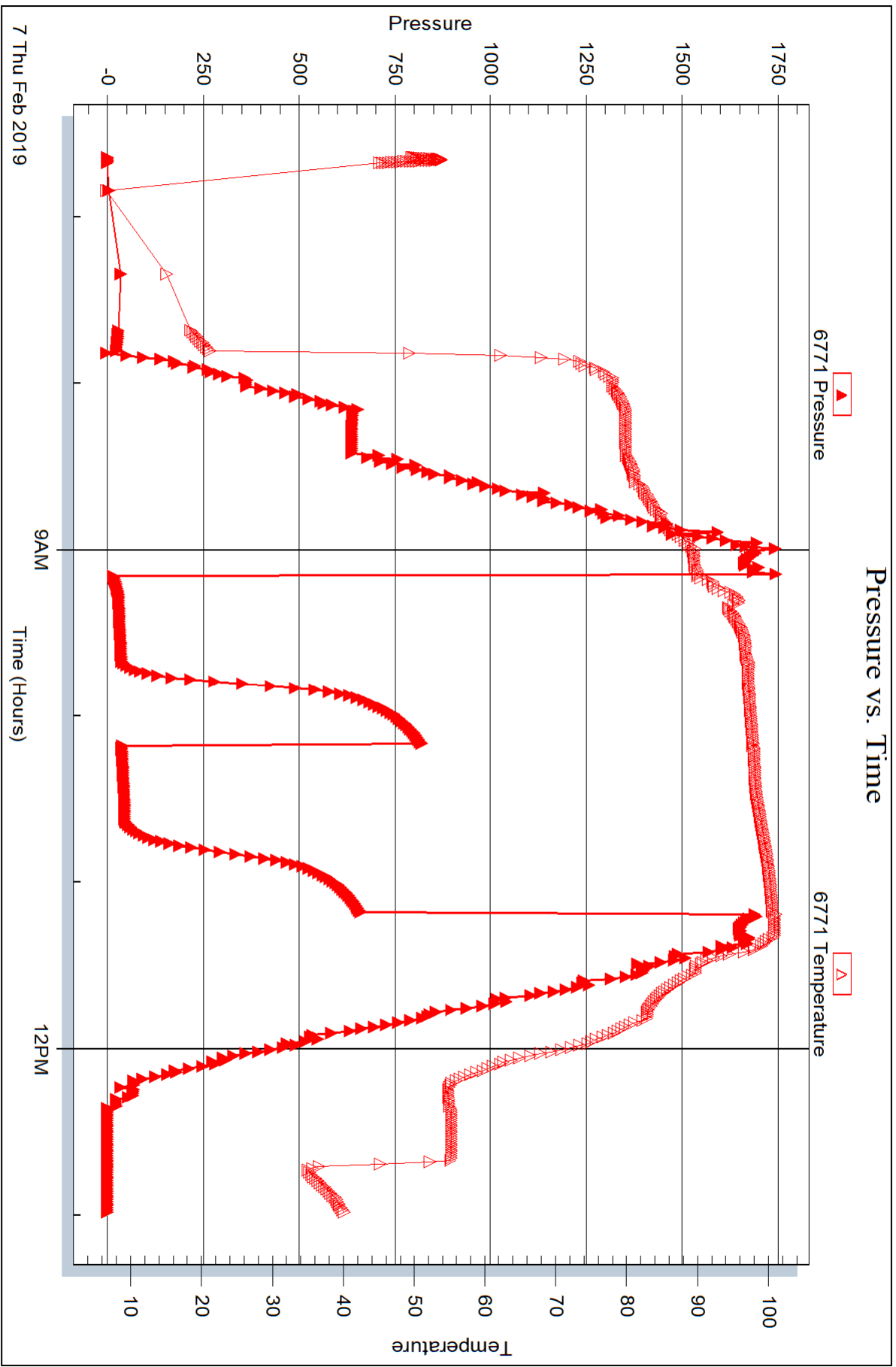
Serial #: 6771

Inside

Dow nung-Nelson Oil Co., Inc.

Ruder #1-31

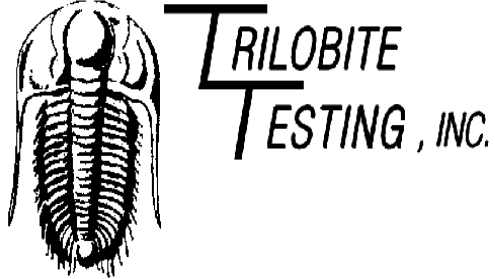
DST Test Number: 3



Trilobite Testing, Inc

Ref. No: 65515

Printed: 2019.02.11 @ 09:42:26



DRILL STEM TEST REPORT

Prepared For: **Downing-Nelson Oil Co., Inc.**

PO Box 1019
Hays, KS 67601

ATTN: Marc Downing

Ruder #1-31

31-14S-18W Ellis,KS

Start Date: 2019.02.08 @ 06:08:50

End Date: 2019.02.08 @ 13:55:41

Job Ticket #: 65516 DST #: 4

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

Printed: 2019.02.11 @ 09:42:01



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Dow ning-Nelson Oil Co., Inc.

31-14S-18W Ellis,KS

PO Box 1019
Hays, KS 67601

Ruder #1-31

Job Ticket: 65516

DST#: 4

ATTN: Marc Dow ning

Test Start: 2019.02.08 @ 06:08:50

GENERAL INFORMATION:

Formation: **Arbuckle**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 08:46:11

Time Test Ended: 13:55:41

Test Type: Conventional Bottom Hole (Reset)

Tester: Brannan Lonsdale

Unit No: 73

Interval: 3669.00 ft (KB) To 3711.00 ft (KB) (TVD)

Reference Elevations: 2076.00 ft (KB)

Total Depth: 3711.00 ft (KB) (TVD)

2068.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 8.00 ft

Serial #: 8700 Outside

Press@RunDepth: 159.24 psig @ 3670.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2019.02.08 End Date: 2019.02.08

Last Calib.: 2019.02.08

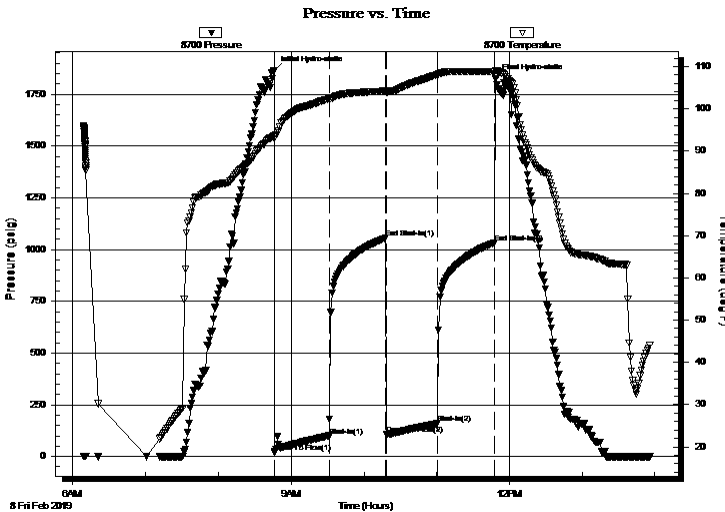
Start Time: 06:08:51 End Time: 13:55:41

Time On Btm: 2019.02.08 @ 08:45:56

Time Off Btm: 2019.02.08 @ 11:48:41

TEST COMMENT: 45- IF- BOB 19 mins. Built to 21.30"
45- IS- Slow ly built to 1.27" then slow ly died back to 0.57"
45- FF- BOB 34 mins. Built to 14.21"
45- FS- Slow ly built to 0.87"

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1865.42	93.71	Initial Hydro-static
1	20.25	93.01	Open To Flow (1)
46	99.98	102.40	Shut-In(1)
92	1055.43	104.22	End Shut-In(1)
93	108.06	103.97	Open To Flow (2)
135	159.24	108.13	Shut-In(2)
182	1033.52	108.78	End Shut-In(2)
183	1825.31	109.10	Final Hydro-static

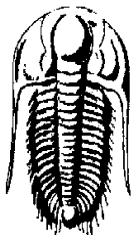
Recovery

Length (ft)	Description	Volume (bbl)
95.00	OCM, 20%O 80%M	1.05
317.00	CGO, 15%G 85%O	4.49
0.00	475' GIP	0.00

* Recovery from multiple tests

Gas Rates

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



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Dow ning-Nelson Oil Co., Inc.

31-14S-18W Ellis,KS

PO Box 1019
Hays, KS 67601

Ruder #1-31

Job Ticket: 65516

DST#: 4

ATTN: Marc Dow ning

Test Start: 2019.02.08 @ 06:08:50

GENERAL INFORMATION:

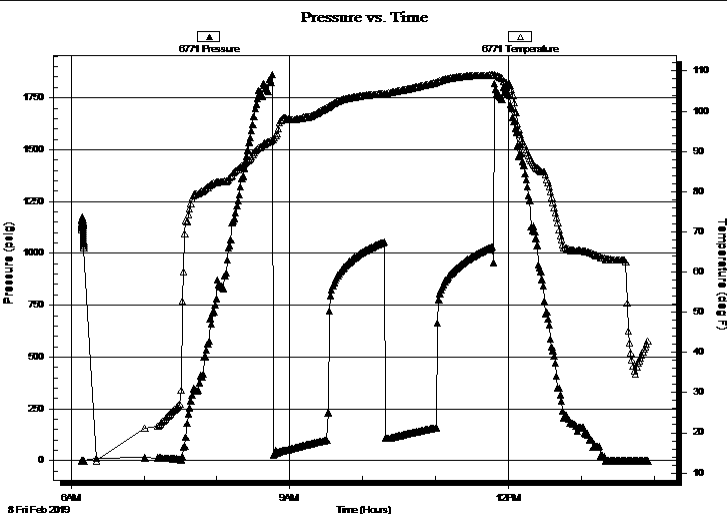
Formation: **Arbuckle**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 08:46:11
 Time Test Ended: 13:55:41
 Interval: **3669.00 ft (KB) To 3711.00 ft (KB) (TVD)**
 Total Depth: 3711.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Brannan Lonsdale
 Unit No: 73
 Reference Elevations: 2076.00 ft (KB)
 2068.00 ft (CF)
 KB to GR/CF: 8.00 ft

Serial #: 6771

Inside

Press@RunDepth: psig @ 3670.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2019.02.08 End Date: 2019.02.08 Last Calib.: 2019.02.08
 Start Time: 06:08:45 End Time: 13:55:20 Time On Btm:
 Time Off Btm:

TEST COMMENT: 45- IF- BOB 19 mins. Built to 21.30"
 45- ISl- Slow ly built to 1.27" then slow ly died back to 0.57"
 45- FF- BOB 34 mins. Built to 14.21"
 45- FSl- Slow ly built to 0.87"



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
95.00	OCM, 20%O 80%M	1.05
317.00	CGO, 15%G 85%O	4.49
0.00	475' GIP	0.00

Gas Rates

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

* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Dow ning-Nelson Oil Co., Inc.

31-14S-18W Ellis,KS

PO Box 1019
Hays, KS 67601

Ruder #1-31

Job Ticket: 65516

DST#: 4

ATTN: Marc Dow ning

Test Start: 2019.02.08 @ 06:08:50

Tool Information

Drill Pipe:	Length: 3646.00 ft	Diameter: 3.82 inches	Volume: 51.68 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 32.00 ft	Diameter: 2.25 inches	Volume: 0.16 bbl	Weight to Pull Loose: 48000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	29.00 ft			String Weight: Initial 48000.00 lb
Depth to Top Packer:	3669.00 ft			Final 48000.00 lb
Depth to Bottom Packer:	ft			
Interval betw een Packers:	42.00 ft			
Tool Length:	62.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			3650.00	
Shut In Tool	5.00			3655.00	
Hydraulic tool	5.00			3660.00	
Packer	5.00			3665.00	20.00 Bottom Of Top Packer
Packer	4.00			3669.00	
Stubb	1.00			3670.00	
Recorder	0.00	6771	Inside	3670.00	
Recorder	0.00	8700	Outside	3670.00	
Perforations	4.00			3674.00	
Change Over Sub	1.00			3675.00	
Drill Pipe	32.00			3707.00	
Change Over Sub	1.00			3708.00	
Bullnose	3.00			3711.00	42.00 Bottom Packers & Anchor

Total Tool Length: 62.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Dow ning-Nelson Oil Co., Inc.

31-14S-18W Ellis,KS

PO Box 1019
Hays, KS 67601

Ruder #1-31

Job Ticket: 65516

DST#: 4

ATTN: Marc Dow ning

Test Start: 2019.02.08 @ 06:08:50

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

26 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 52.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.99 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 9500.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
95.00	OCM, 20%O 80%M	1.050
317.00	CGO, 15%G 85%O	4.494
0.00	475' GIP	0.000

Total Length: 412.00 ft

Total Volume: 5.544 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

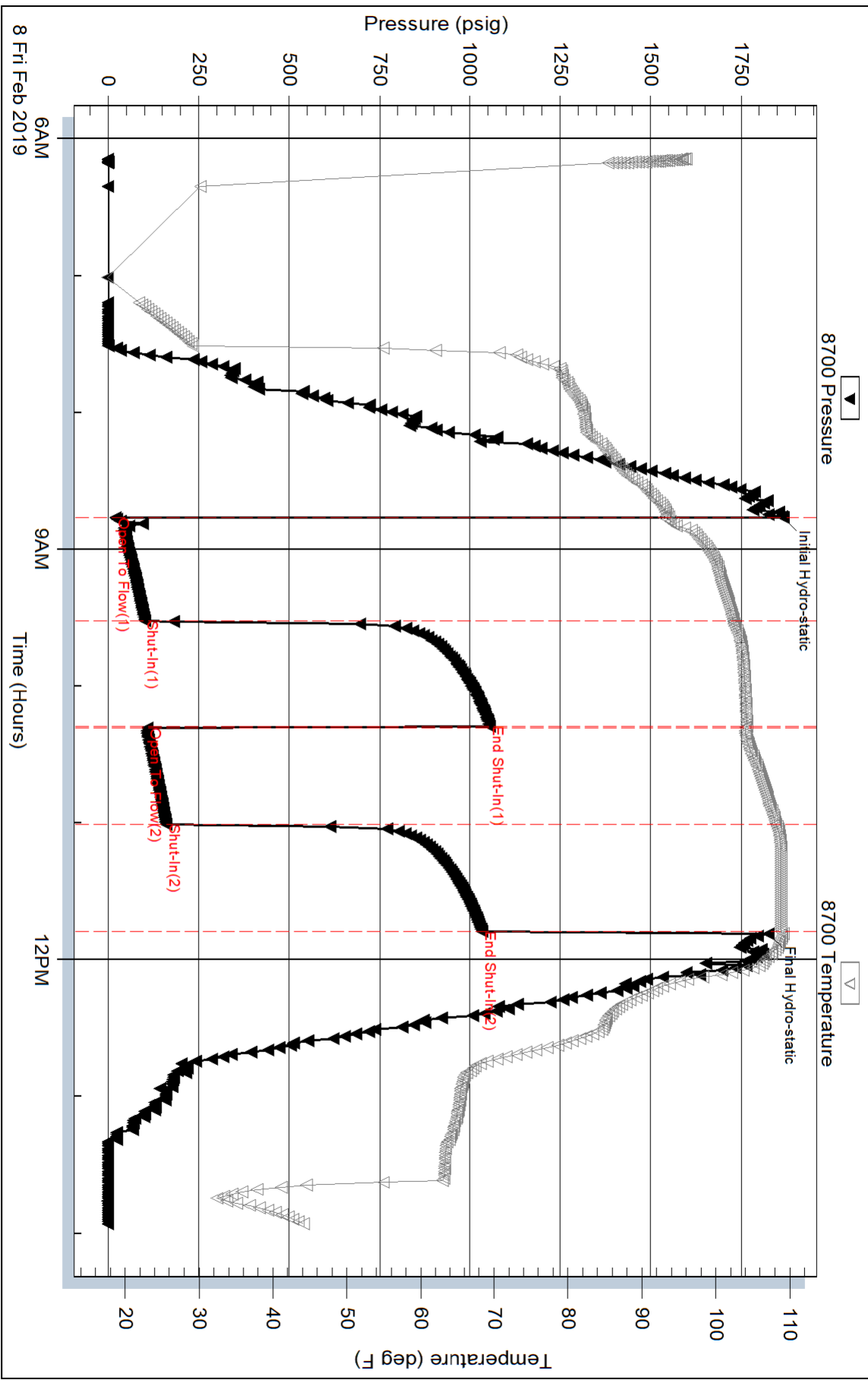
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

Pressure vs. Time



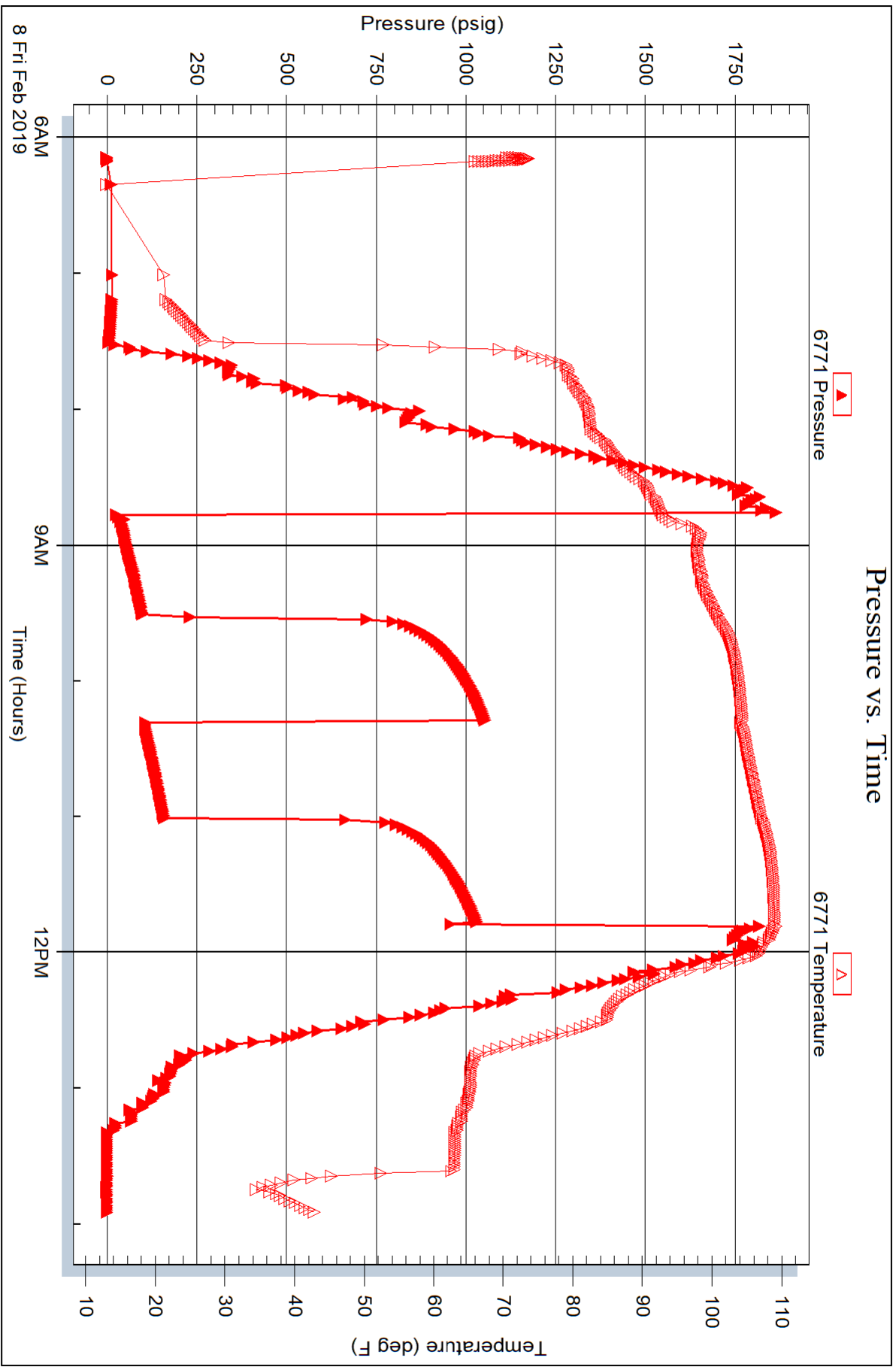
Serial #: 6771

Inside

Dow nung-Nelson Oil Co., Inc.

Ruder #1-31

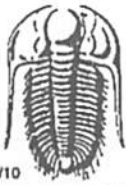
DST Test Number: 4



Trilobite Testing, Inc

Ref. No: 65516

Printed: 2019.02.11 @ 09:42:02



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 65513

Well Name & No. Rader #1-31 Test No. 1 Date 2/5/19
 Company Downing-Nelson Oil Co., Inc. Elevation 2076 KB 2068 GL
 Address PO Box 1019 Hays, KS 67601
 Co. Rep / Geo. Marc Downing Rig Discovery 4
 Location: Sec. 31 Twp 14 S Rge. 18 W Co. Ellis State KS

Interval Tested 3394-3424 Zone Tested LKC "C"
 Anchor Length 30' Drill Pipe Run 3361 Mud Wt. 8.8
 Top Packer Depth 3389 Drill Collars Run 32 Vis 51
 Bottom Packer Depth 3394 Wt. Pipe Run --- WL 76
 Total Depth 3424 Chlorides 18,000 ppm System LCM 2#
 Blow Description IF - Slightly built to 0.97"
FSF - No Blow
FF - Very weak surface flow
FSF - No Blow

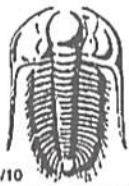
Rec	Feet of	%gas	%oil	%water	%mud
<u>2</u>	<u>M</u>				

Rec Total 2' BHT 94° Gravity --- API RW --- @ --- °F Chlorides --- ppm

(A) Initial Hydrostatic <u>1662</u>	<input checked="" type="checkbox"/> Test <u>1050</u>	T-On Location <u>2005</u>
(B) First Initial Flow <u>10</u>	<input type="checkbox"/> Jars <u>---</u>	T-Started <u>2820</u>
(C) First Final Flow <u>12</u>	<input type="checkbox"/> Safety Joint <u>---</u>	T-Open <u>2350</u>
(D) Initial Shut-In <u>22</u>	<input type="checkbox"/> Circ Sub <u>---</u>	T-Pulled <u>2/6</u> <u>0150</u>
(E) Second Initial Flow <u>11</u>	<input type="checkbox"/> Hourly Standby <u>---</u>	T-Out <u>0317</u>
(F) Second Final Flow <u>11</u>	<input checked="" type="checkbox"/> Mileage <u>26 RT</u> <u>26</u>	Comments <u>---</u>
(G) Final Shut-In <u>18</u>	<input type="checkbox"/> Sampler <u>---</u>	
(H) Final Hydrostatic <u>1613</u>	<input type="checkbox"/> Straddle <u>---</u>	
Initial Open <u>30</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>30</u>	<input type="checkbox"/> Extra Recorder <u>---</u>	<input type="checkbox"/> Ruined Packer <u>---</u>
Final Shut-In <u>30</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>1076</u>	Total <u>1076</u>

Approved By _____ Our Representative Brian Lonsdale

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. 65514

Well Name & No. Rader #1-31 Test No. 2 Date 2/6/19
 Company Downing-Nelson Oil Co, Inc. Elevation 2076 KB 2068 GL
 Address PO Box 1019 Hays, KS 67601
 Co. Rep / Geo. Marc Downing Rig Discovery 4
 Location: Sec. 31 Twp 14 S Rge. 18 W Co. Ellis State KS

Interval Tested 3421-3443 Zone Tested LKE "D"
 Anchor Length 22' Drill Pipe Run 3392 Mud Wt. 8.9
 Top Packer Depth 3416 Drill Collars Run 32 Vis 52
 Bottom Packer Depth 3421 Wt. Pipe Run --- WL 7.6
 Total Depth 3443 Chlorides 7,000 ppm System LCM 2nd

Blow Description FF - Slowly built to 11.13"
ISI - No Flow
FF - Slowly built to 7.75"
FSI - No Flow

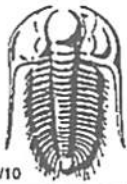
Rec	Feet of	%gas	%oil	%water	%mud
<u>180</u>	<u>MW</u>			<u>90</u>	<u>10</u>
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 180' BHT 109° Gravity --- API RW .13 @ 37° F Chlorides 62500 ppm

(A) Initial Hydrostatic <u>1658</u>	<input checked="" type="checkbox"/> Test <u>1050</u>	T-On Location <u>0905</u>
(B) First Initial Flow <u>14</u>	<input type="checkbox"/> Jars	T-Started <u>0925</u>
(C) First Final Flow <u>66</u>	<input type="checkbox"/> Safety Joint	T-Open <u>1139</u>
(D) Initial Shut-In <u>451</u>	<input type="checkbox"/> Circ Sub	T-Pulled <u>1439</u>
(E) Second Initial Flow <u>68</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>1645</u>
(F) Second Final Flow <u>103</u>	<input checked="" type="checkbox"/> Mileage <u>26 RT</u> 26	Comments
(G) Final Shut-In <u>447</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>1625</u>	<input type="checkbox"/> Straddle	
Initial Open <u>45</u>	<input type="checkbox"/> Shale Packer	<input type="checkbox"/> EM Tool
Initial Shut-In <u>45</u>	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Ruined Shale Packer
Final Flow <u>45</u>	<input type="checkbox"/> Extra Recorder	<input type="checkbox"/> Ruined Packer
Final Shut-In <u>45</u>	<input type="checkbox"/> Day Standby	Extra Copies
	<input type="checkbox"/> Accessibility	Sub Total <u>0</u>
	Sub Total <u>1076</u>	Total
		MP/DST Disc't

Approved By _____ Our Representative Brannon Lonsdale

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. **65515**

Well Name & No. Ruder #1-31 Test No. 3 Date 2/7/19
 Company Downing-Nelson Oil Co, Inc. Elevation 2076 KB 2068 GL
 Address PO Box 1019 Hays, KS 67601
 Co. Rep / Geo. Marc Downing Rig Discovery #4
 Location: Sec. 31 Twp 14 S Rge. 18 W Co. Ellis State KS

Interval Tested 3508-3559 Zone Tested LKC "HTJ"
 Anchor Length 51' Drill Pipe Run 3488 Mud Wt. 8.9
 Top Packer Depth 3503 Drill Collars Run 32 Vls 52
 Bottom Packer Depth 3508 Wt. Pipe Run _____ WL 7.6
 Total Depth 3559 Chlorides 7000 ppm System LCM 2^H

Blow Description IF - slowly built to 1.56" in 6 mins then slowly died back to 0.82"
ISI - No blow
FF - slowly built to 1.44"
FSTI - No blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>65</u>	<u>WSOCM</u>		<u>5</u>	<u>20</u>	<u>85</u>
<u>5</u>	<u>CO</u>				

Rec Total 70' BHT 100° Gravity 36 API RW .21 @ 41 °F Chlorides 35000 ppm

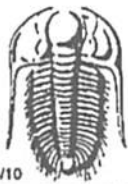
(A) Initial Hydrostatic 1728 Test 1050 T-On Location 0611
 (B) First Initial Flow 15 Jars _____ T-Started 0638
 (C) First Final Flow 37 Safety Joint _____ T-Open 0908
 (D) Initial Shut-In 820 Circ Sub _____ T-Pulled 1108
 (E) Second Initial Flow 37 Hourly Standby _____ T-Out 1259
 (F) Second Final Flow 46 Mileage 26 RT 26 Comments _____
 (G) Final Shut-In 660 Sampler _____
 (H) Final Hydrostatic 1701 Straddle _____
 Shale Packer _____
 Extra Packer _____
 Extra Recorder _____
 Day Standby _____
 Accessibility _____

Initial Open 30
 Initial Shut-In 30
 Final Flow 30
 Final Shut-In 30

Sub Total 1076 MP/DST Disc't _____

Approved By _____ Our Representative Braman Lonsdale

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. **65516**

Well Name & No. Rudger #1-31 Test No. 4 Date 2/8/19
 Company Downing-Nelson Oil Co., Inc. Elevation 2076 KB 2068 GL
 Address PO Box 1019 Hays, KS 67601
 Co. Rep / Geo. Marc Downing Rig Discovery 4
 Location: Sec. 31 Twp 14 S Rge. 18 W Co. Ellis State KS

Interval Tested 3669-3711 Zone Tested Arbuckle
 Anchor Length 42' Drill Pipe Run 3646 Mud Wt. 9.0
 Top Packer Depth 3664 Drill Collars Run 32 Vis 52
 Bottom Packer Depth 3669 Wt. Pipe Run --- WL 8.0
 Total Depth 3711 Chlorides 9,500 ppm System LCM 2#

Blow Description IF-BOB 19 mins. Built to 21.30"
ISI - Slowly built to 1.27" in 26 mins then slowly died back to 0.57"
PF-BOB 34 mins. Built to 14.21"
PSI - Slowly built to 0.87"

Rec	Feet of	%gas	%oil	%water	%mud
<u>95</u>	<u>OCM</u>	<u>20</u>	<u>80</u>	<u>---</u>	<u>---</u>
<u>317</u>	<u>CGO</u>	<u>15</u>	<u>85</u>	<u>---</u>	<u>---</u>
	<u>475' WJP</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>
		<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>
		<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>

Rec Total 412' BHT 109° Gravity 26 API RW --- @ --- °F Chlorides --- ppm

(A) Initial Hydrostatic 1865 Test 1050 T-On Location 0525
 (B) First Initial Flow 20 Jars --- T-Started 0609
 (C) First Final Flow 100 Safety Joint --- T-Open 0845
 (D) Initial Shut-In 1055 Circ Sub --- T-Pulled 1145
 (E) Second Initial Flow 108 Hourly Standby --- T-Out 1355
 (F) Second Final Flow 159 Mileage 26 RT 26
 (G) Final Shut-In 1034 Sampler ---
 (H) Final Hydrostatic 1825 Straddle ---

Initial Open 45 Shale Packer --- EM Tool ---
 Initial Shut-In 45 Extra Packer --- Ruined Shale Packer ---
 Final Flow 45 Extra Recorder --- Ruined Packer ---
 Final Shut-In 45 Day Standby --- Extra Copies ---
 Sub Total 0 Accessibility ---
 Sub Total 1076 Sub Total 1076 MP/DST Disc't ---

Approved By _____ Our Representative Brannan Lonsdale

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