



**TRILOBITE  
TESTING, INC.**

**KCC  
SEP 10 2009  
CONFIDENTIAL**

**DRILL STEM TEST REPORT**

Prepared For: **H&C Operating Company**

PO Box 86  
Plainville KS 67663

ATTN: Clayton Erickson

**4 7s 23w Graham KS**

**Worcester #4-1**

Start Date: 2009.08.08 @ 06:17:39

End Date: 2009.08.08 @ 12:27:09

Job Ticket #: 35232                      DST #: 1

**RECEIVED**

**SEP 15 2009**

**KCC WICHITA**

Trilobite Testing, Inc

PO Box 1733 Hays, KS 67601

ph: 785-625-4778 fax: 785-625-5620

H&C Operating Company

Worcester #4-1

4 7s 23w Graham KS

DST # 1

LKC-"C-D"

2009.08.08



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

H&C Operating Company

**Worcester #4-1**

PO Box 86  
Plainville KS 67663

**4 7s 23w Graham KS**

Job Ticket: 35232      **DST#: 1**

ATTN: Clayton Erickson

Test Start: 2009.08.08 @ 06:17:39

## GENERAL INFORMATION:

Formation: **LKC-"C-D"**  
 Deviated: **No Whipstock**      ft (KB)  
 Time Tool Opened: 08:15:39  
 Time Test Ended: 12:27:09

Test Type: **Conventional Bottom Hole**  
 Tester: **Jason McLemore**  
 Unit No: **32**

Interval: **3750.00 ft (KB) To 3792.00 ft (KB) (TVD)**  
 Total Depth: **3792.00 ft (KB) (TVD)**  
 Hole Diameter: **7.80 inches** Hole Condition: **Good**

Reference Elevations: **2472.00 ft (KB)**  
**2467.00 ft (CF)**  
 KB to GR/CF: **5.00 ft**

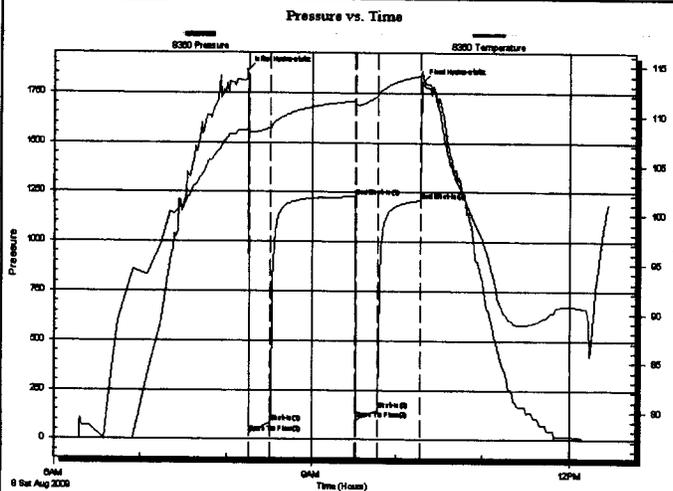
## Serial #: 8360

**Inside**

Press@RunDepth: **149.72 psig @ 3754.00 ft (KB)**  
 Start Date: **2009.08.08**      End Date: **2009.08.08**  
 Start Time: **06:17:41**      End Time: **12:27:09**

Capacity: **7000.00 psig**  
 Last Calib.: **2009.08.08**  
 Time On Btm: **2009.08.08 @ 08:14:39**  
 Time Off Btm: **2009.08.08 @ 10:18:09**

**TEST COMMENT:** IFF-Good Blow ,BOB in 8 Min.  
 ISI-Blow back Built to 3"  
 FFP-Good Blow ,BOB in 7 Min.  
 FSI-Blow back Built to 3"



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1860.60	108.65	Initial Hydro-static
1	32.87	108.20	Open To Flow (1)
16	86.37	108.79	Shut-in(1)
76	1226.55	111.49	End Shut-in(1)
77	104.87	110.96	Open To Flow(2)
93	149.72	112.03	Shut-in(2)
123	1207.58	114.03	End Shut-in(2)
124	1801.91	114.55	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
120.00	MCO-60%O-40%M	1.68
190.00	Free Oil	2.67
0.00	410 Gas In Pipe	0.00

## Gas Rates

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



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

H&C Operating Company

**Worcester #4-1**

PO Box 86  
Plainville KS 67663

**4 7s 23w Graham KS**

Job Ticket: 35232

**DST#: 1**

ATTN: Clayton Erickson

Test Start: 2009.08.08 @ 06:17:39

**Tool Information**

Drill Pipe:	Length: 3738.00 ft	Diameter: 3.80 inches	Volume: 52.43 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.70 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: 2.25 inches	Volume: 0.00 bbl	Weight to Pull Loose: 55000.00 lb
		<b>Total Volume:</b>	<b>52.43 bbl</b>	Tool Chased 0.00 ft
Drill Pipe Above KB:	9.00 ft			String Weight: Initial 45000.00 lb
Depth to Top Packer:	3750.00 ft			Final 50000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	42.00 ft			
Tool Length:	63.00 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			3730.00	
Shut In Tool	5.00			3735.00	
Hydraulic tool	5.00			3740.00	
Packer	5.00			3745.00	21.00 Bottom Of Top Packer
Packer	5.00			3750.00	
Stubb	1.00			3751.00	
Perforations	3.00			3754.00	
Recorder	0.00	8360	Inside	3754.00	
Change Over Sub	1.00			3755.00	
Recorder	0.00	6755	Inside	3755.00	
Blank Spacing	31.00			3786.00	
Change Over Sub	1.00			3787.00	
Perforations	2.00			3789.00	
Bullnose	3.00			3792.00	42.00 Bottom Packers & Anchor

**Total Tool Length: 63.00**

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TESTING, INC**

## DRILL STEM TEST REPORT

**FLUID SUMMARY**

H&C Operating Company

**Worcester #4-1**

PO Box 86  
Plainville KS 67663

**4 7s 23w Graham KS**

Job Ticket: 35232

**DST#: 1**

ATTN: Clayton Erickson

Test Start: 2009.08.08 @ 06:17:39

### Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

24 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 49.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 8.98 in<sup>3</sup>

Gas Cushion Type:

Gas Cushion Pressure:

psig

Resistivity: ohm.m

Salinity: 1000.00 ppm

Filter Cake: inches

### Recovery Information

Recovery Table

Length ft	Description	Volume bbl
120.00	MCO-60%O-40%M	1.683
190.00	Free Oil	2.665
0.00	410 Gas In Pipe	0.000

Total Length: 310.00ft

Total Volume: 4.348 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

Serial #: 8360

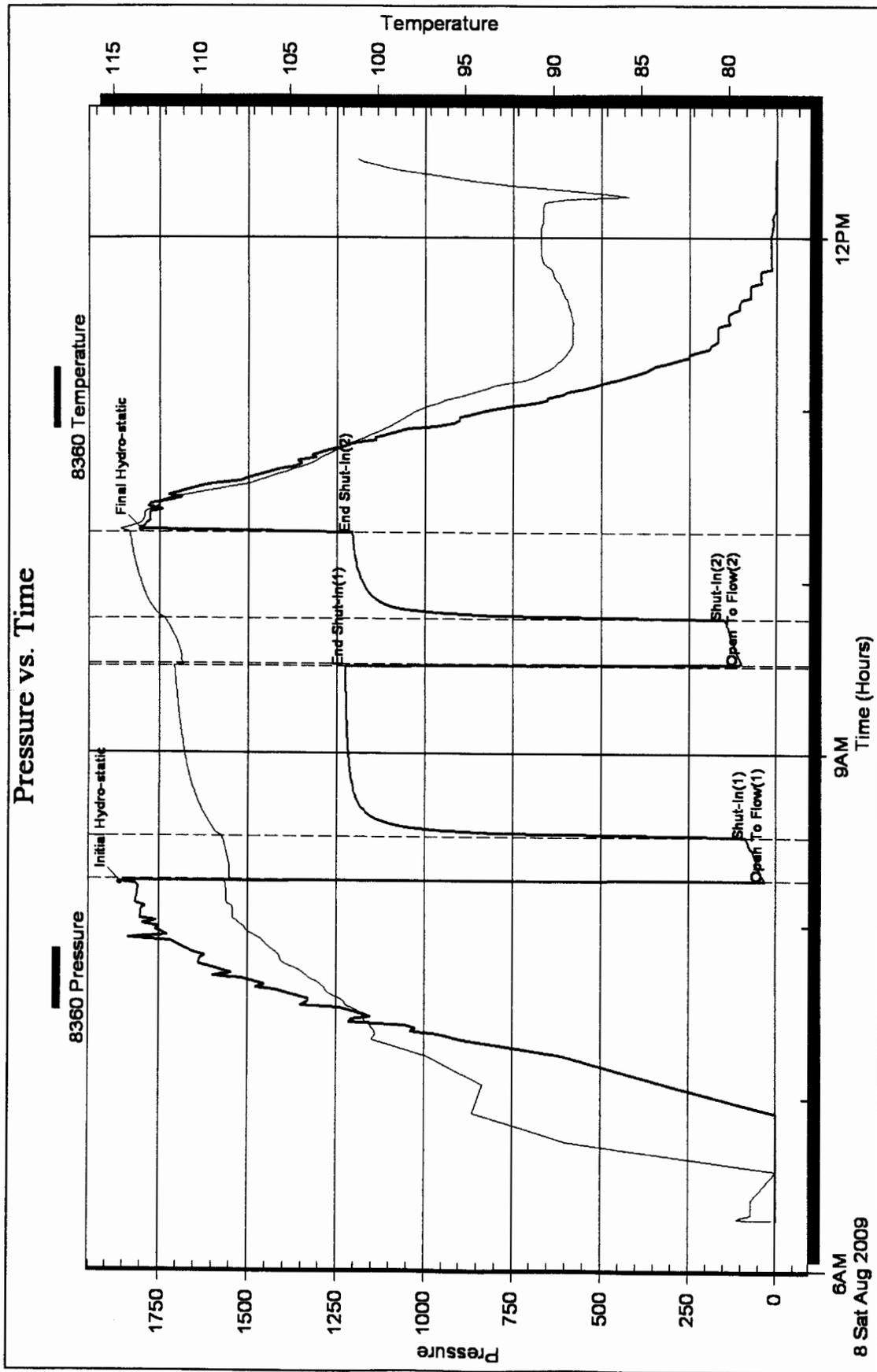
Inside

H&C Operating Company

4 7s 23w Graham KS

DST Test Number: 1

### Pressure vs. Time



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Ref. No: 35232

Trilobite Testing, Inc

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**TRILOBITE  
TESTING, INC.**

**DRILL STEM TEST REPORT**

Prepared For: **H&C Operating Company**

PO Box 86  
Plainville KS 67663

ATTN: Clayton Erickson

**4 7s 23w Graham KS**

**Worcester #4-1**

Start Date: 2009.08.09 @ 05:32:38

End Date: 2009.08.09 @ 13:47:38

Job Ticket #: 36418                      DST #: 2

Trilobite Testing, Inc  
PO Box 1733 Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

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H&C Operating Company

Worcester #4-1

4 7s 23w Graham KS

DST # 2

LKC "H,J,J"

2009.08.09



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

H&C Operating Company

**Worcester #4-1**

PO Box 86  
Plainville KS 67663

**4 7s 23w Graham KS**

ATTN: Clayton Erickson

Job Ticket: 36418

**DST#: 2**

Test Start: 2009.08.09 @ 05:32:38

## GENERAL INFORMATION:

Formation: LKC "H,I,J"  
Deviated: No Whipstock: ft (KB)  
Time Tool Opened: 07:22:08  
Time Test Ended: 13:47:38

Test Type: Conventional Bottom Hole  
Tester: Brett Dickinson  
Unit No: 32

Interval: 3838.00 ft (KB) To 3894.00 ft (KB) (TVD)  
Total Depth: 3894.00 ft (KB) (TVD)  
Hole Diameter: 7.80 inches Hole Condition: Good

Reference Elevations: 2472.00 ft (KB)  
2467.00 ft (CF)  
KB to GRVCF: 5.00 ft

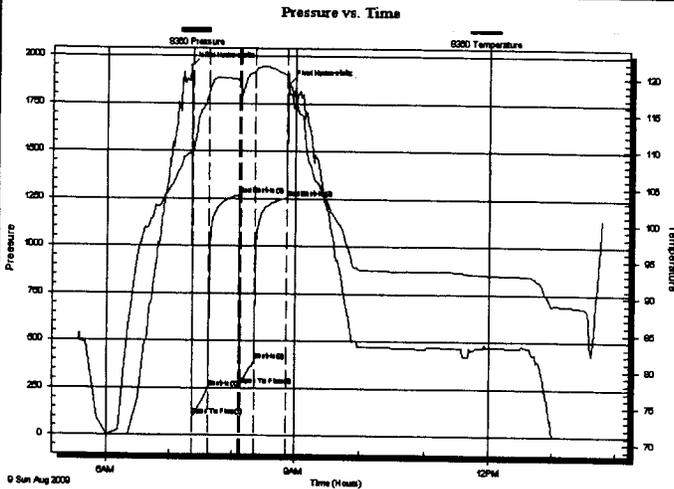
## Serial #: 8360

Inside

Press@RunDepth: 393.12 psig @ 3855.00 ft (KB)  
Start Date: 2009.08.09 End Date: 2009.08.09  
Start Time: 05:32:40 End Time: 13:47:38

Capacity: 7000.00 psig  
Last Calib.: 2009.08.09  
Time On Btrr: 2009.08.09 @ 07:20:08  
Time Off Btrr: 2009.08.09 @ 08:53:08

TEST COMMENT: IF- BOB in 1.5min  
IS- BOB in 10min  
FF- BOB in 1min  
FSI- BOB in 11min



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1945.70	109.63	Initial Hydro-static
2	100.53	109.71	Open To Flow (1)
17	248.30	117.74	Shut-In(1)
47	1269.35	119.59	End Shut-In(1)
48	266.46	118.36	Open To Flow (2)
61	393.12	120.62	Shut-In(2)
92	1253.75	120.28	End Shut-In(2)
93	1856.08	118.14	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
900.00	Free Oil 15%G 85%O	12.62

## Gas Rates

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



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**DRILL STEM TEST REPORT**

**TOOL DIAGRAM**

H&C Operating Company

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Job Ticket: 36418

**DST#: 2**

ATTN: Clayton Erickson

Test Start: 2009.08.09 @ 05:32:38

**Tool Information**

Drill Pipe:	Length: 3827.00 ft	Diameter: 3.80 inches	Volume: 53.68 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.70 inches	Volume: 0.00 bbl	Weight set on Packer: lb
Drill Collar:	Length: 0.00 ft	Diameter: 2.25 inches	Volume: 0.00 bbl	Weight to Pull Loose: 50000.00 lb
			<u>Total Volume: 53.68 bbl</u>	Tool Chased ft
Drill Pipe Above KB:	10.00 ft			String Weight: Initial 45000.00 lb
Depth to Top Packer:	3838.00 ft			Final 48000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	56.00 ft			
Tool Length:	77.00 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			3818.00	
Shut In Tool	5.00			3823.00	
Hydraulic tool	5.00			3828.00	
Packer	5.00			3833.00	21.00      Bottom Of Top Packer
Packer	5.00			3838.00	
Stubb	1.00			3839.00	
Perforations	16.00			3855.00	
Recorder	0.00	8360	Inside	3855.00	
Change Over Sub	1.00			3856.00	
Recorder	0.00	6755	Inside	3856.00	
Blank Spacing	32.00			3888.00	
Change Over Sub	1.00			3889.00	
Perforations	2.00			3891.00	
Bullnose	3.00			3894.00	56.00      Bottom Packers & Anchor

**Total Tool Length:    77.00**



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Job Ticket: 36418

**DST#: 2**

ATTN: Clayton Erickson

Test Start: 2009.08.09 @ 05:32:38

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

37 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 49.00 sec/qt

Cushion Volume:

bbl

Water Loss: 8.95 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 1000.00 ppm

Filter Cake: inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
900.00	Free Oil 15%G 85%O	12.625

Total Length: 900.00 ft

Total Volume: 12.625 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

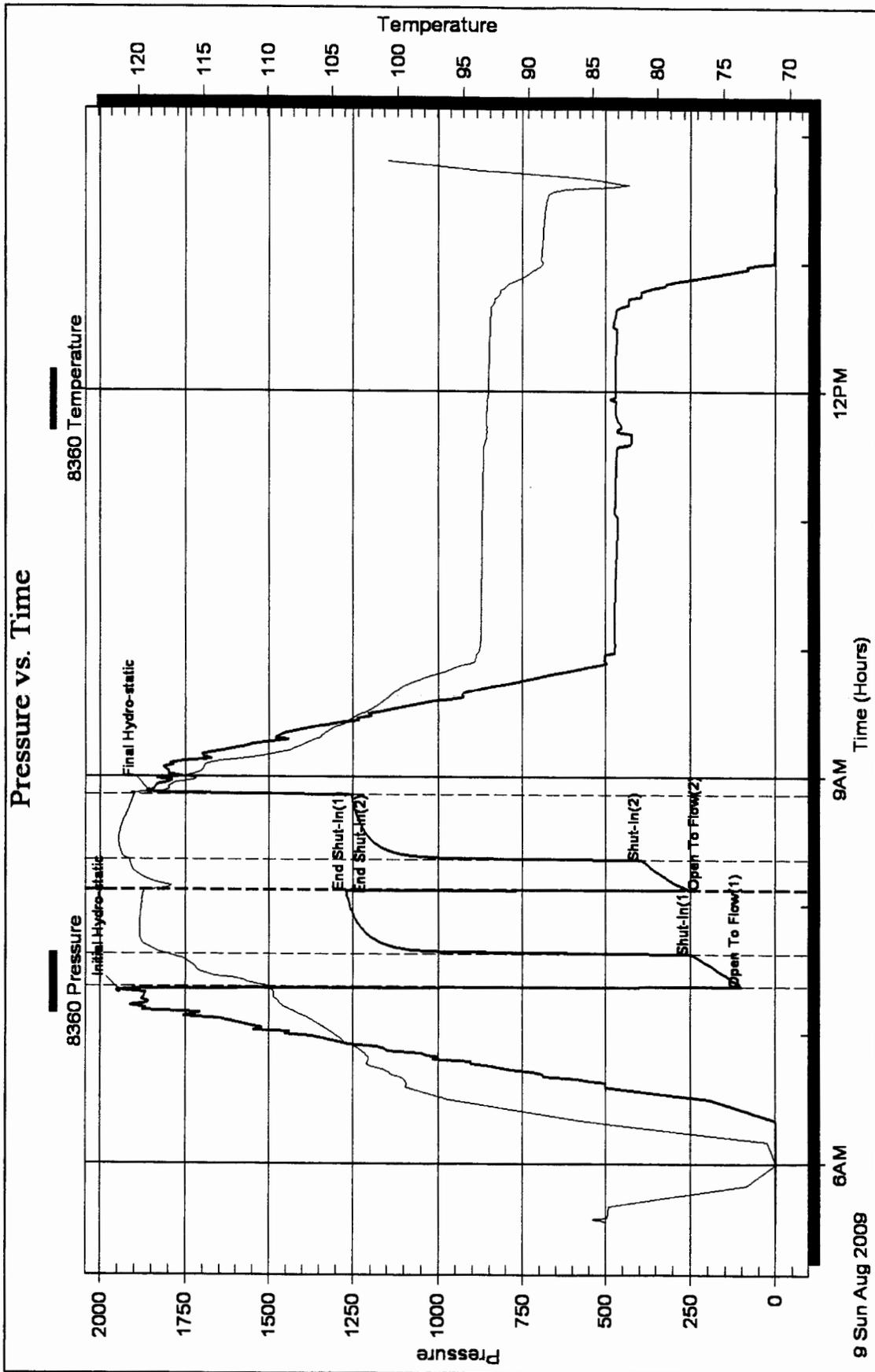
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

### Pressure vs. Time



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