

TRILOBITE TESTING COMPANY

P.O. Box 362 • Hays, Kansas 67601

Drill-Stem Test Data

Well Name NORMAN #1 Test No. 1 Date 5/14/91
Company ABERCROMBIE DRILLING INC Zone Tested ARBUCKLE
Address 150 N MAIN #801 WICHITA KS 67202 Elevation 2039 GL
Co. Rep./Geo. MR STEVE FRANKAMP Cont. ABERCROMBIE #4 Est. Ft. of Pay 2
Location: Sec. 32 Twp. 18S Rge. 17W Co. RUSH State KANSAS

Interval Tested 3746-3795
Anchor Length 49
Top Packer Depth 3741
Bottom Packer Depth 3746
Total Depth 3795

Drill Pipe Size 4.5 XH
Wt. Pipe I.D. - 2.7 Ft. Run 630
Drill Collar - 2.25 Ft. Run

Mud Wt. 9 lb / gal. Viscosity 45 Filtrate 11.2

Tool Open @ 6:45 PM Initial Blow WEAK TO FAIR 4" IN WATER

Final Blow WEAK THROUGHOUT-2" IN WATER

Recovery — Total Feet 630 Flush Tool? NO

Rec. 120 Feet of GAS IN PIPE

Rec. 510 Feet of CLEAN OIL

Rec. 60 Feet of GAS & MUD CUT OIL-20%GAS / 50% OIL/30%MUD

Rec. 60 Feet of GAS & MUD CUT OIL-15%GAS/40%OIL/45%MUD

Rec. 112 Feet of BHT °F Gravity 44 °API @ 70 °F Corrected Gravity 43 °API

RW @ °F Chlorides ppm Recovery Chlorides 6000 ppm System

(A) Initial Hydrostatic Mud 1878.3 PSI Ak1 Recorder No. 13277 Range 4125

(B) First Initial Flow Pressure 72.6 PSI @ (depth) 3756 w/Clock No. N

(C) First Final Flow Pressure 115.5 PSI AK1 Recorder No. 24174 Range 3350

(D) Initial Shut-in Pressure 1142.6 PSI @ (depth) 3795 w/Clock No.

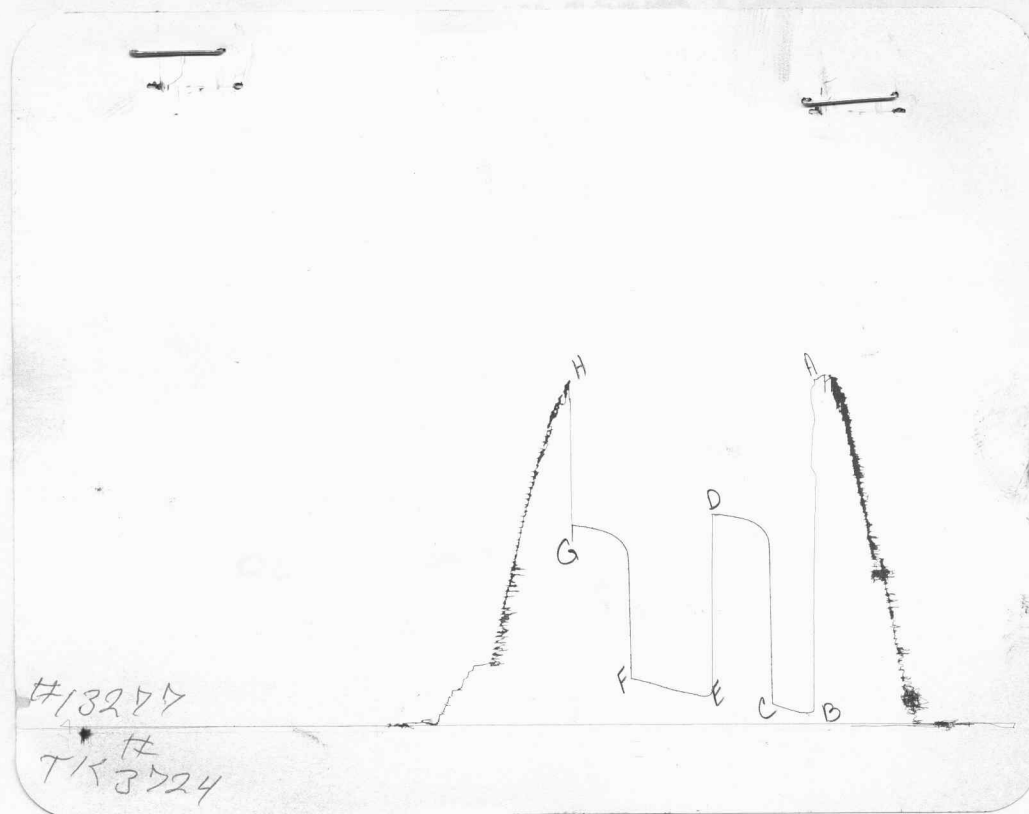
(E) Second Initial Flow Pressure 155.1 PSI AK1 Recorder No. Range

(F) Second Final Flow Pressure 259 PSI @ (depth) w/Clock No.

(G) Final Shut-in Pressure 1087.2 PSI Initial Opening 30 Final Flow 60

(H) Final Hydrostatic Mud 1868.3 PSI Initial Shut-in 45 Final Shut-in 45

Our Representative MR HARRY SCHMIDT] TOTAL PRICE \$ 600



POINT

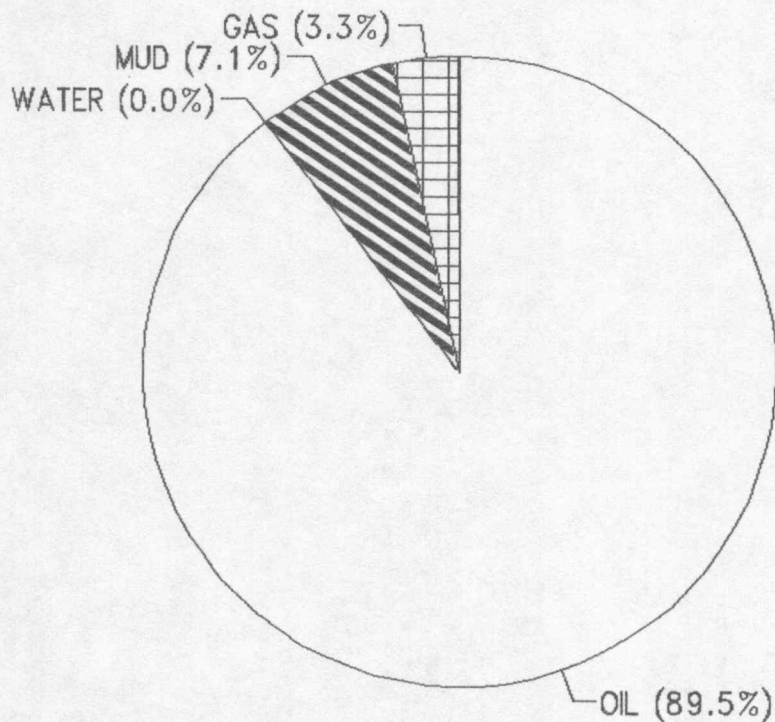
This is an actual photograph of recorder chart
PRESSURE

	FIELD READING	OFFICE READING
(A) INITIAL HYDROSTATIC MUD	1873	1878.3
(B) FIRST INITIAL FLOW PRESSURE	54	72.6
(C) FIRST FINAL FLOW PRESSURE	118	115.5
(D) INITIAL CLOSED-IN PRESSURE	1142	1142.6
(E) SECOND INITIAL FLOW PRESSURE	140	155.1
(F) SECOND FINAL FLOW PRESSURE	259	259
(G) FINAL CLOSED-IN PRESSURE	1090	1087.2
(H) FINAL HYDROSTATIC MUD	1873	1868.3

DST # 1 CALCULATED RECOVERY ANALYSIS WEIGHT PIPE
 TICKET # 3724

SAMPLE #	TOTAL FEET	GAS		OIL		WATER		MUD	
		%	FEET	%	FEET	%	FEET	%	FEET
1	510	0	0	100	510	0	0	0	0
2	60	20	12	50	30	0	0	30	18
3	60	15	9	40	24	0	0	45	27
4			0		0		0		0
5			0		0		0		0
TOTAL	630	3.33	21	89.5238	564	0	0	7.14286	45

BBL OIL= 3.948 * HRS OPEN BBL/DAY 1.5 63.168
 BBL WATER 0 * 0
 BBL MUD= 0.315



COMPUTER EVALUATION BY TRILOBITE TESTING
ABERCROMBIE DRLG CO INC
REPORT FOR DST#1 FOR THE NORMAN #1
32-18S-17W RUSH KS

TEST PARAMETERS

ELEVATION: 2039 KB EST. PAY: 2 FT
DATUM: -1757 ZONE TESTED: ARBUCKLE
TEST INTERVAL: 3746-3795
TIME INTERVALS: 30-45-60-45
RECORDER DEPTH: 3795 VISCOSITY: 6.555408 CP
BOTTOM HOLE TEMP: 112 HOLE SIZE: 7.875 IN

CALCULATIONS

CUBIC FEET OF GAS IN PIPE: 9.580726

TOTAL FEET OF RECOVERY: 630
BARRELS IN WEIGHT PIPE: 4.41
GAS OIL RATIO: 2.1725 CU.FT./BBL
BUBBLE POINT PRESSURE: ; 3.579713E-02
TOTAL BARRELS OF RECOVERY: 4.41

UNCORR. INIT. PROD.: 70.56 BBL/DAY

API GRAVITY: 43

FLUID GRADIENT: .351

CORRECTED PIPE FILLUP: 737.8918

CORR. BARRELS OF RECOVERY: 5.93154 BBL

INITIAL PRODUCTION CORRECTED TO FINAL FLOW PRESSURE: 94.90465 BBL/DAY

INITIAL PRODUCTION CORRECTED TO PSEUDO STEADY FLOW STATE

56.29915

INITIAL SLOPE 147.08 PSI/CYCLE

INITIAL P* 1175 PSI

FINAL SLOPE 125.86 PSI/CYCLE

FINAL P* 1147 PSI

2.38% decline

TRANSMISSIBILITY	122.6084 (MD.-FT./CP.)
PERMEABILITY	401.8741 (MD.)
INDICATED FLOW CAPACITY	803.7483 (MD.FT)
PRODUCTIVITY INDEX	.1385475 (BARRELS/DAY/PSI)
DAMAGE RATIO	1.291149
RADIUS OF INVESTIGATION	190.1806 (FT.)
THEORETICAL POTENTIAL FROM FINAL FLOW PRESSURE	122.536 BBL/DAY
THEORITICAL POTENTIAL FROM PSEUDO STEADY FLOW STATE	72.69058 BBL/DAY
POTENTIOMETRIC SURFACE	903.8931 (FT.)
DRAWDOWN FACTOR	2.382976 (%)

INITIAL FLOW

RECORDER # 24174

DST #1

DT(MIN)	PRESSURE	<> PRESSURE
0	72.6	72.6
3	70.9	-1.699997
6	75.9	5
9	80.8	4.900002
12	87.4	6.599999
15	94	6.599999
18	100.6	6.599999
21	108.9	8.300003
24	115.5	6.599999

FINAL FLOW

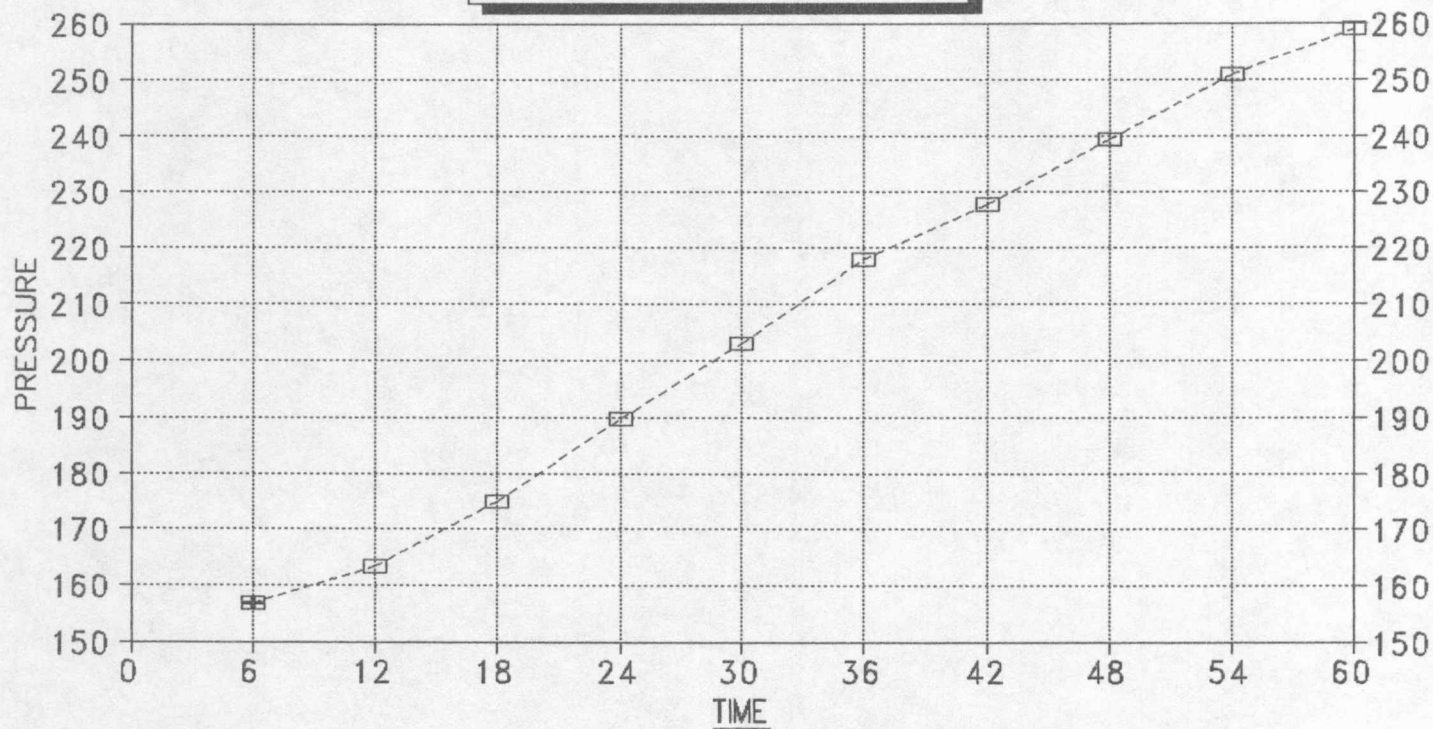
RECORDER # 24174

DST #1

DT(MIN)	PRESSURE	<> PRESSURE
0	155.1	155.1
6	156.7	1.599991
12	163.3	6.600006
18	174.9	11.599999
24	189.7	14.8
30	202.9	13.2
36	217.8	14.90001
42	227.7	9.899994
48	239.2	11.5
54	250.8	11.60001
60	259	8.199997

DELTA T DELTA P

FINAL FLOW - DST #1



INITIAL PRODUCTION CORRECTED TO PSEUDO STEADY FLOW STATE 56.29915 BBL/DAY

NORMAN #1
INITIAL

DST #1
SHUTIN
30 INITIAL FLOW TIME

Slope -147.08 psi/cycle
P * 1,175 psi

TIME(MIN)	Pws (psi)	Horn T	Log		<> PRESSURE
			Horn T		
3	1041.9	11	1.041		1041.9
6	1067.1	6	0.778		25.2
9	1083.8	4	0.637		16.7
12	1098.9	4	0.544		15.1
15	1109.0	3	0.477		10.1
18	1114.0	3	0.426		5.0
21	1119.1	2	0.385		5.1
24	1122.4	2	0.352		3.3
27	1127.5	2	0.325		5.1
30	1129.2	2	0.301		1.7
33	1132.5	2	0.281		3.3
36	1135.9	2	0.263		3.4
39	1137.5	2	0.248		1.6
42	1139.2	2	0.234		1.7
45	1142.6	2	0.222		3.4

X

X
NORMAN #1
FINAL

DST #1
SHUTIN
90 TOTAL FLOW TIME

Slope -125.86 psi/cycle
P * 1,147 psi

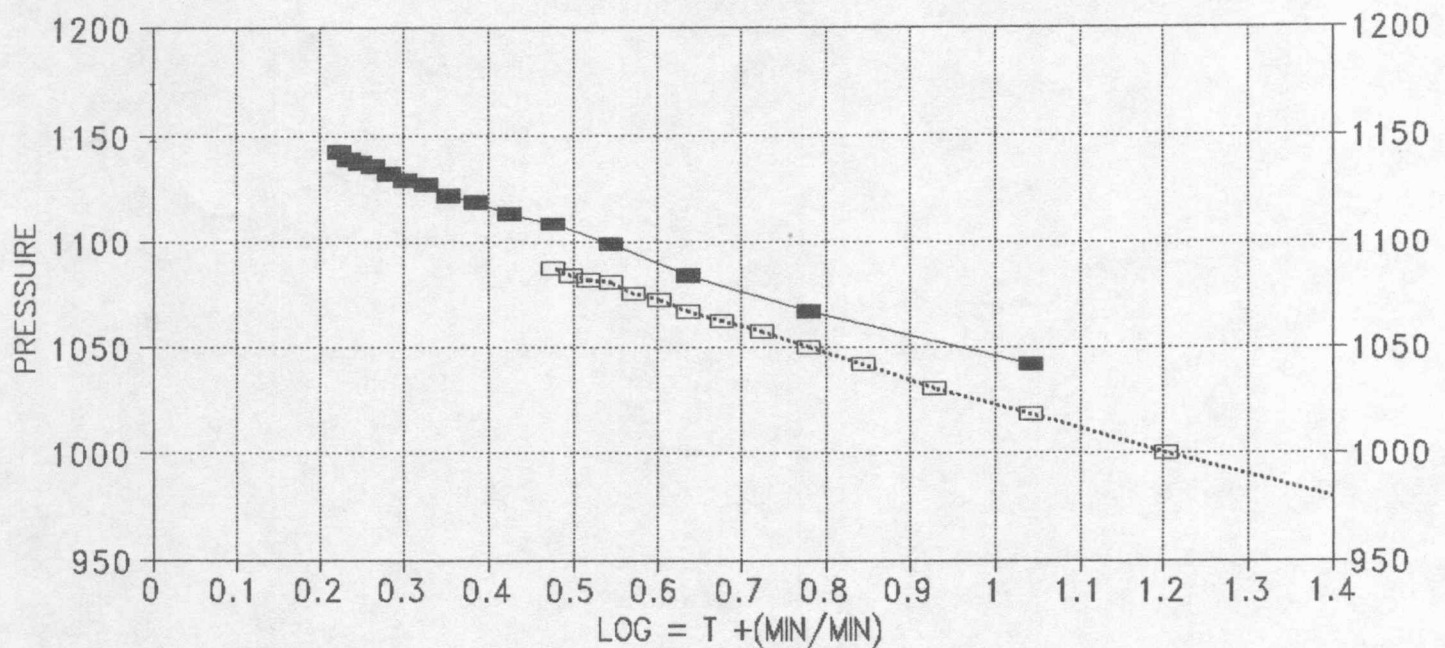
TIME(MIN)	Pws (psi)	Horn T	Log		<> PRESSURE
			Horn T		
3	971.6	31	1.491		971.6
6	1000.0	16	1.204		28.4
9	1018.4	11	1.041		18.4
12	1030.2	9	0.929		11.8
15	1041.9	7	0.845		11.7
18	1050.3	6	0.778		8.4
21	1057.0	5	0.723		6.7
24	1062.0	5	0.677		5.0
27	1067.1	4	0.637		5.1
30	1072.1	4	0.602		5.0
33	1075.5	4	0.571		3.4
36	1080.5	4	0.544		5.0
39	1082.2	3	0.520		1.7
42	1083.8	3	0.497		1.6
45	1087.2	3	0.477		3.4

X

X

HORNER PLOT

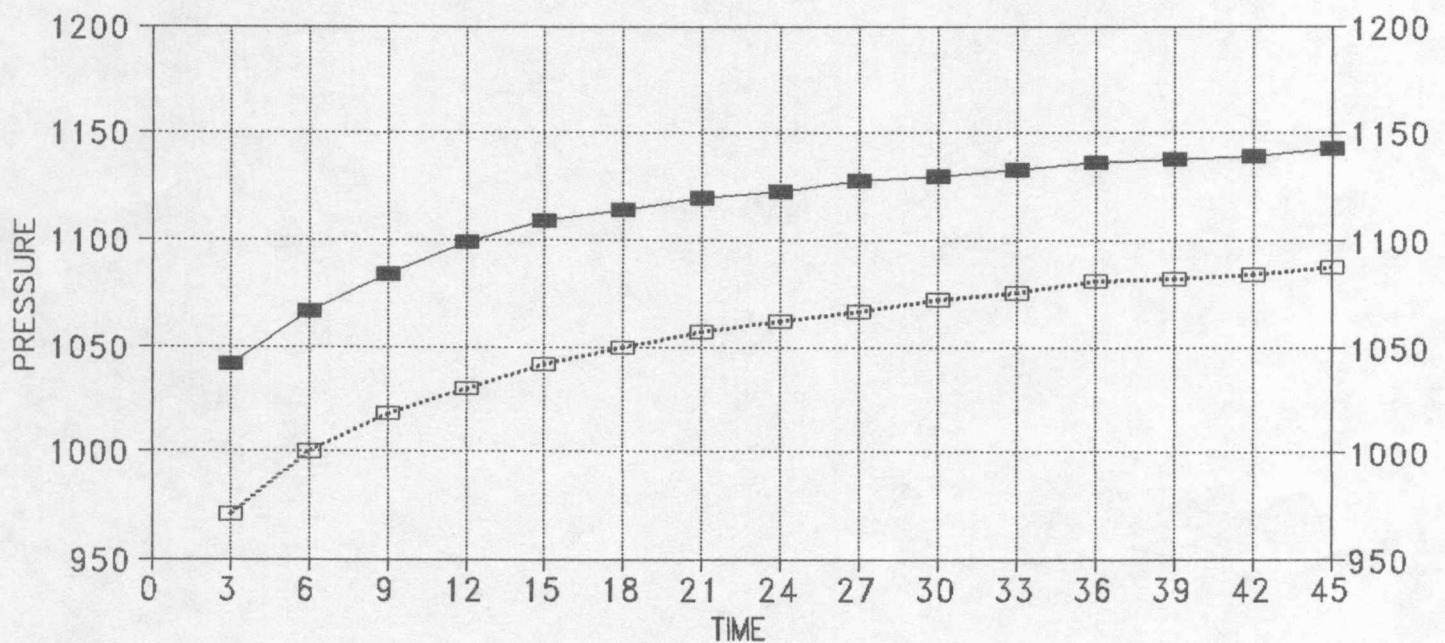
DST #1-NORMAN #1



—■— INITIAL ...□... FINAL

DELTA T DELTA P

DST #1-NORMAN #1



—■— INITIAL ...□... FINAL

TRILOBITE TESTING COMPANY

P.O. Box 362 • Hays, Kansas 67601

Test Ticket

Nº 3724

Well Name & No. <u>NORMAN #1</u>	Test No. <u>ONE</u>	Date <u>5-14-91</u>
Company <u>ABERCROMBIE DRIG. CO. INC.</u>	Zone Tested <u>APR</u>	
Address <u>150 N. MAIN SUITE 801 WICHITA KS 67203</u>	Elevation <u>2039 G.L.</u>	
Co. Rep./Geo. <u>STEVE FRANKAMP</u>	Cont. <u>C/TOOLS</u>	Est. Ft. of Pay <u>2</u>
Location: Sec. <u>32</u>	Twp. <u>18S</u>	Rge. <u>17W</u> Co. <u>RUSK</u> State <u>KS</u>
No. of Copies <u>5</u>	Distribution Sheet <u>Yes</u>	Turnkey <u>NO</u> Yes <u>NO</u> Evaluation <u>YES</u>

Interval Tested <u>3746 TO 3795</u>	Drill Pipe Size <u>4 1/2" X 11</u>
Anchor Length <u>49</u>	Top Choke — 1" Bottom Choke — 3/4"
Top Packer Depth <u>3741</u>	Hole Size — 7 7/8" Rubber Size — 6 3/4"
Bottom Packer Depth <u>3746</u>	Wt. Pipe I.D. — 2.7 Ft. Run <u>630</u>
Total Depth <u>3795</u>	Drill Collar — 2.25 Ft. Run <u>-</u>
Mud Wt. <u>9.0</u> lb/gal.	Viscosity <u>45</u> Filtrate <u>11.2</u>
Tool Open @ <u>6:45</u>	Initial Blow <u>WEAK TO FAIR 4" IN WATER</u>

Final Blow WEAK THROUGHOUT 2" IN WATER

Recovery — Total Feet <u>630</u>	Feet of Gas in Pipe <u>120</u>	Flush Tool? <u>NO</u>
Rec. <u>510</u> Feet Of <u>CLEAN OIL</u>	(20% gas (50% oil	% water 30% mud
Rec. <u>60</u> Feet Of <u>G + M.C. OIL</u>	45% gas 40% oil	% water 45% mud
Rec. <u>60</u> Feet Of <u>" "</u>	5% gas 5% oil	% water % mud
Rec. _____ Feet Of _____	% gas % oil	% water % mud
Rec. _____ Feet Of _____	% gas % oil	% water % mud

BHT <u>112</u> °F	Gravity <u>44</u>	°API @ <u>70</u>	°F Corrected Gravity <u>43</u>	°API
RW <u>-</u> @ <u>-</u> °F	Chlorides <u>-</u>	ppm Recovery	Chlorides <u>6000</u>	ppm System
(A) Initial Hydrostatic Mud <u>1873</u>	PSI	AK1 Recorder No. <u>13277</u>	Range <u>4125</u>	
(B) First Initial Flow Pressure <u>54</u>	PSI	@ (depth) <u>3756</u>	w/Clock No. _____	
(C) First Final Flow Pressure <u>118</u>	PSI	AK1 Recorder No. <u>24174</u>	Range <u>3350</u>	
(D) Initial Shut-In Pressure <u>1142</u>	PSI	@ (depth) <u>3795</u>	w/Clock No. _____	
(E) Second Initial Flow Pressure <u>140</u>	PSI	AK1 Recorder No. _____	Range _____	
(F) Second Final Flow Pressure <u>259</u>	PSI	@ (depth) _____	w/Clock No. _____	
(G) Final Shut-In Pressure <u>1090</u>	PSI	Initial Opening <u>30</u>	Test <u>550</u>	
(H) Final Hydrostatic Mud <u>1873</u>	PSI	Initial Shut-In <u>45</u>	Jars _____	

TRILOBITE TESTING COMPANY SHALL NOT BE LIABLE FOR DAMAGE OF ANY KIND OF THE PROPERTY OR PERSONNEL OF THE ONE FOR WHOM A TEST IS MADE, OR FOR ANY LOSS SUFFERED OR SUBSTAINED, 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.

Final Flow <u>60</u>	Safety Joint _____
Final Shut-In <u>45</u>	Straddle _____
	Circ. Sub _____
	Sampler _____
	Extra Packer _____
	Other _____
	TOTAL PRICE \$ <u>550.00</u>

Approved By Steve Frankamp

Our Representative [Signature]