

# TRILOBITE TESTING COMPANY

P.O. Box 362 • Hays, Kansas 67601

## Computer inventoried Drill-Stem Test Data

Well Name ZIEGENBALG #1 Test No. 1 Date 10-8-91  
Company CASTLE RESOURCES Zone Tested KS CITY  
Address BOX 90 HAYS KS 67601 Elevation 2629 KB  
Co. Rep./Geo. JERRY GREEN Cont. EMPHASIS #8 Est. Ft. of Pay \_\_\_\_\_  
Location: Sec. 01 Twp. 15S Rge. 30W Co. GOVE State KS

Interval Tested 3838-3880 Drill Pipe Size 4.5 XH  
Anchor Length 42 Wt. Pipe I.D. - 2.7 Ft. Run \_\_\_\_\_  
Top Packer Depth 3833 Drill Collar - 2.25 Ft. Run \_\_\_\_\_  
Bottom Packer Depth 3838  
Total Depth 3880

Mud Wt. 9.2 lb / gal. Viscosity 39 Filtrate 11

Tool Open @ 6:14 PM Initial Blow WEAK SURFACE BLOW FOR 14 MINUTES

Final Blow NO BLOW- FLUSHED TOOL- NO BLOW

Recovery — Total Feet 25 Flush Tool? YES

Rec. 35 Feet of GAS IN PIPE

Rec. 22 Feet of OIL CUT MUD-5%OIL/95%MUD

Rec. 3 Feet of CLEAN OIL

Rec. \_\_\_\_\_ Feet of \_\_\_\_\_

Rec. \_\_\_\_\_ Feet of \_\_\_\_\_

BHT 116 °F Gravity \_\_\_\_\_ °API @ \_\_\_\_\_ °F Corrected Gravity \_\_\_\_\_ °API

RW \_\_\_\_\_ @ \_\_\_\_\_ °F Chlorides \_\_\_\_\_ ppm Recovery Chlorides 3100 ppm System

(A) Initial Hydrostatic Mud 1855.6 PSI AK1 Recorder No. 13308 Range 4700

(B) First Initial Flow Pressure 25.6 PSI @ (depth) 3848 w/Clock No. 27573

(C) First Final Flow Pressure 25.6 PSI AK1 Recorder No. 2023 Range 4000

(D) Initial Shut-In Pressure 1010.6 PSI @ (depth) 3875 w/Clock No. 8376

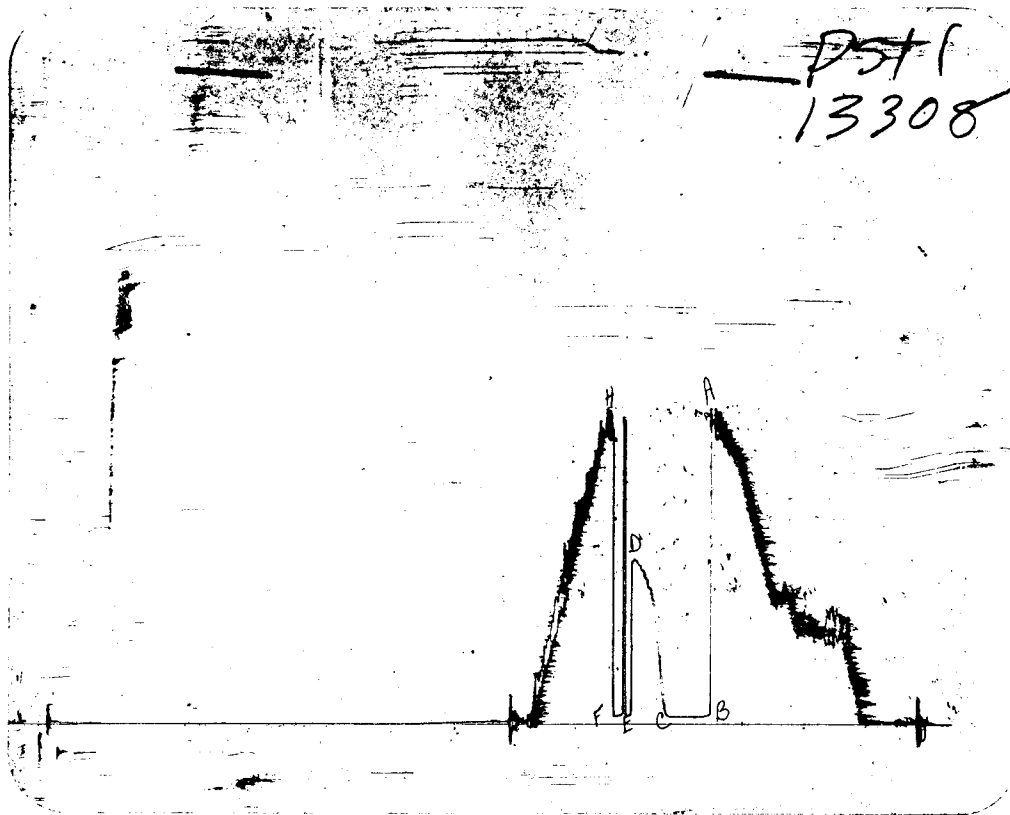
(E) Second Initial Flow Pressure 25.6 PSI AK1 Recorder No. \_\_\_\_\_ Range \_\_\_\_\_

(F) Second Final Flow Pressure 25.6 PSI @ (depth) \_\_\_\_\_ w/Clock No. \_\_\_\_\_

(G) Final Shut-In Pressure \_\_\_\_\_ PSI Initial Opening 30 Final Flow 13

(H) Final Hydrostatic Mud 1830.4 PSI Initial Shut-In 30 Final Shut-In \_\_\_\_\_

Our Representative MARK HERSKOWITZ TOTAL PRICE \$ 550



POINT This is an actual photograph of recorder chart PRESSURE

POINT	FIELD READING	OFFICE READING
(A) INITIAL HYDROSTATIC MUD	1848	1855.6
(B) FIRST INITIAL FLOW PRESSURE	22	25.6
(C) FIRST FINAL FLOW PRESSURE	22	25.6
(D) INITIAL CLOSED-IN PRESSURE	1002	1010.6
(E) SECOND INITIAL FLOW PRESSURE	22	25.6
(F) SECOND FINAL FLOW PRESSURE	22	25.6
(G) FINAL CLOSED-IN PRESSURE		
(H) FINAL HYDROSTATIC MUD	1828	1830.4

# TRILOBITE TESTING COMPANY

P.O. Box 362 • Hays, Kansas 67601

## Test Ticket

No. 3986

Well Name & No. <u>ZIEGENBach 1</u>	Test No. <u>1</u>	Date <u>10-8-91</u>
Company <u>CASTLE RES</u>	Zone Tested <u>KC</u>	
Address <u>BOX 90 HAYS KS</u>	Elevation _____	
Co. Rep./Geo. <u>JERRY GREEN</u>	Cont. <u>EMPHASIS RIG</u>	Est. Ft. of Pay _____
Location: Sec. <u>01</u>	Twp. <u>15 S</u>	Rge. <u>30 W</u> Co. <u>GROVE</u> State <u>KS</u>
No. of Copies _____	Distribution Sheet _____	Yes _____ No _____ Turnkey _____ Yes _____ No _____ Evaluation _____

Interval Tested <u>3838 - 3880</u>	Drill Pipe Size <u>4 1/2 XH</u>
Anchor Length <u>42</u>	Top Choke — 1" _____ Bottom Choke — 3/4" _____
Top Packer Depth <u>3833</u>	Hole Size — 7 7/8" _____ Rubber Size — 6 3/4" _____
Bottom Packer Depth <u>3838</u>	Wt. Pipe I.D. — 2.7 Ft. Run _____
Total Depth <u>3880</u>	Drill Collar — 2.25 Ft. Run _____
Mud Wt. <u>9.2</u> <u>LCM 42</u> lb/gal.	Viscosity <u>39</u> Filtrate <u>11.0</u>
Tool Open @ <u>6:14 PM</u>	Initial Blow <u>WEAK SWP BLOW FOR 14 MIN</u>
Final Blow <u>No Blow Flush Tool</u>	<u>No Blow</u>

Recovery — Total Feet <u>25</u>	Feet of Gas in Pipe <u>35</u>	Flush Tool? <u>7:19</u>
Rec. <u>23</u> Feet Of <u>Oil Mvd</u>	%gas <u>5</u> %oil _____ %water <u>95</u> %mud _____	
Rec. <u>2</u> Feet Of <u>C Oil</u>	%gas <u>100</u> %oil _____ %water _____ %mud _____	
Rec. _____ Feet Of _____	%gas _____ %oil _____ %water _____ %mud _____	
Rec. _____ Feet Of _____	%gas _____ %oil _____ %water _____ %mud _____	
Rec. _____ Feet Of _____	%gas _____ %oil _____ %water _____ %mud _____	

BHT 114 °F Gravity \_\_\_\_\_ °API @ \_\_\_\_\_ °F Corrected Gravity \_\_\_\_\_ °API

RW \_\_\_\_\_ @ \_\_\_\_\_ °F Chlorides \_\_\_\_\_ ppm Recovery Chlorides 3100 ppm System

- (A) Initial Hydrostatic Mud 1848 PSI Ak1 Recorder No. 13308 Range 4700
- (B) First Initial Flow Pressure 22 PSI @ (depth) 3848 w/Clock No. 27573
- (C) First Final Flow Pressure 22 PSI AK1 Recorder No. 2023 Range 4000
- (D) Initial Shut-In Pressure 1002 PSI @ (depth) 3875 w/Clock No. 8374
- (E) Second Initial Flow Pressure 22 PSI AK1 Recorder No. \_\_\_\_\_ Range \_\_\_\_\_
- (F) Second Final Flow Pressure 22 PSI @ (depth) \_\_\_\_\_ w/Clock No. \_\_\_\_\_
- (G) Final Shut-In Pressure \_\_\_\_\_ PSI Initial Opening 30 Test
- (H) Final Hydrostatic Mud 1828 PSI Initial Shut-In 30 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 13 Safety Joint \_\_\_\_\_  
Final Shut-In \_\_\_\_\_ Straddle \_\_\_\_\_

Approved By \_\_\_\_\_  
Our Representative Mark Hensley

Circ. Sub  NC  
Sampler \_\_\_\_\_  
Extra Packer \_\_\_\_\_  
Other \_\_\_\_\_  
TOTAL PRICE \$ \_\_\_\_\_

# TRILOBITE TESTING COMPANY

P.O. Box 362 • Hays, Kansas 67601

## Drill-Stem Test Data

Well Name ZIEGENBALG #1 Test No. 2 Date 10-9-91  
Company CASTLE RESOURCES Zone Tested MYRICH STATIO  
Address BOX 90 HAYS KS 67601 Elevation 2629 KB  
Co. Rep./Geo. JERRY GREEN Cont. EMPHASIS #8 Est. Ft. of Pay 6  
Location: Sec. 01 Twp. 15S Rge. 30W Co. GOVE State KS

Interval Tested 4110-4200 Drill Pipe Size 4.5 XH  
Anchor Length 90 Wt. Pipe I.D. - 2.7 Ft. Run \_\_\_\_\_  
Top Packer Depth 4105 Drill Collar — 2.25 Ft. Run \_\_\_\_\_  
Bottom Packer Depth 4110  
Total Depth 4200

Mud Wt. 9.3 lb / gal. Viscosity 44 Filtrate 10.6

Tool Open @ 1:43 AM Initial Blow GOOD BLOW OFF BOTTOM IN 1 MINUTE 45 SECONDS

Final Blow OFF BOTTOM IN 1 MINUTE 15 SECONDS

Recovery — Total Feet 1000 Flush Tool? NO

Rec. 1208 Feet of GAS IN PIPE

Rec. 1000 Feet of MUD CUT OIL 10%GAS/80%OIL/10%MUD

Rec. \_\_\_\_\_ Feet of \_\_\_\_\_

Rec. \_\_\_\_\_ Feet of \_\_\_\_\_

Rec. \_\_\_\_\_ Feet of \_\_\_\_\_

BHT 123 °F Gravity 35 °API @ 80 °F Corrected Gravity 33 °API

RW \_\_\_\_\_ @ \_\_\_\_\_ °F Chlorides \_\_\_\_\_ ppm Recovery Chlorides 3100 ppm System

(A) Initial Hydrostatic Mud 2016.9 PSI Ak1 Recorder No. 13308 Range 4700

(B) First Initial Flow Pressure 64.9 PSI @ (depth) 4112 w/Clock No. 27573

(C) First Final Flow Pressure 225.7 PSI AK1 Recorder No. 2023 Range 4000

(D) Initial Shut-in Pressure 783.1 PSI @ (depth) 4135 w/Clock No. 8376

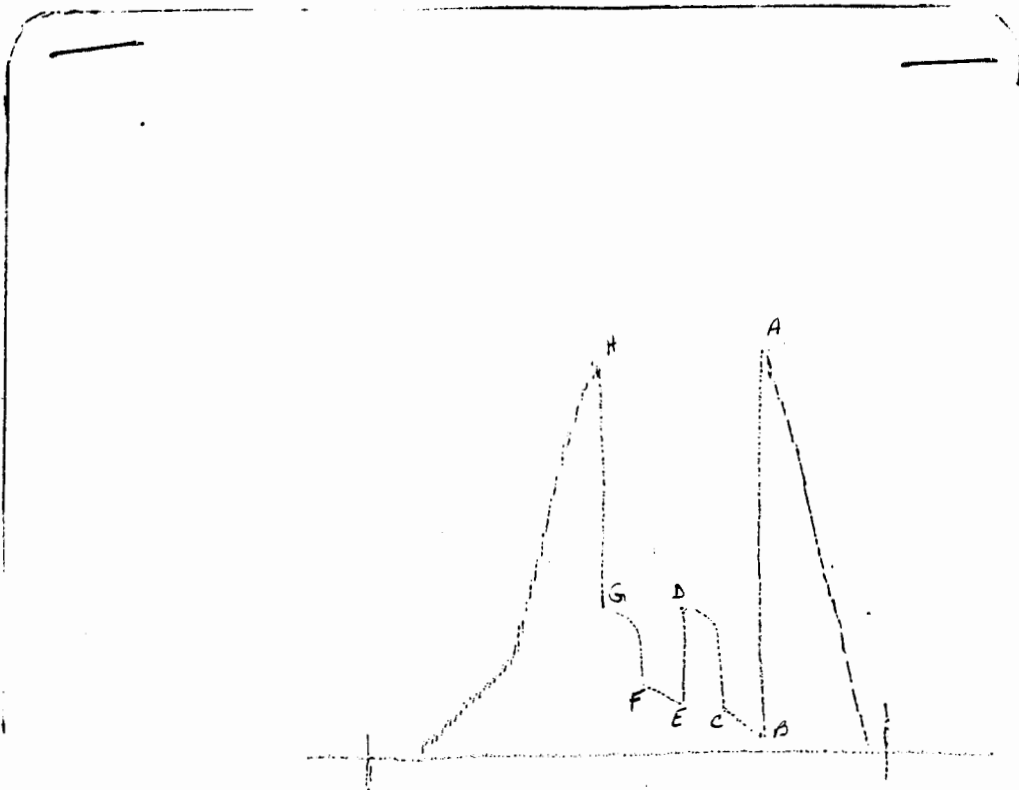
(E) Second Initial Flow Pressure 277.5 PSI AK1 Recorder No. \_\_\_\_\_ Range \_\_\_\_\_

(F) Second Final Flow Pressure 377.2 PSI @ (depth) \_\_\_\_\_ w/Clock No. \_\_\_\_\_

(G) Final Shut-in Pressure 773.52 PSI Initial Opening 30 Final Flow 30

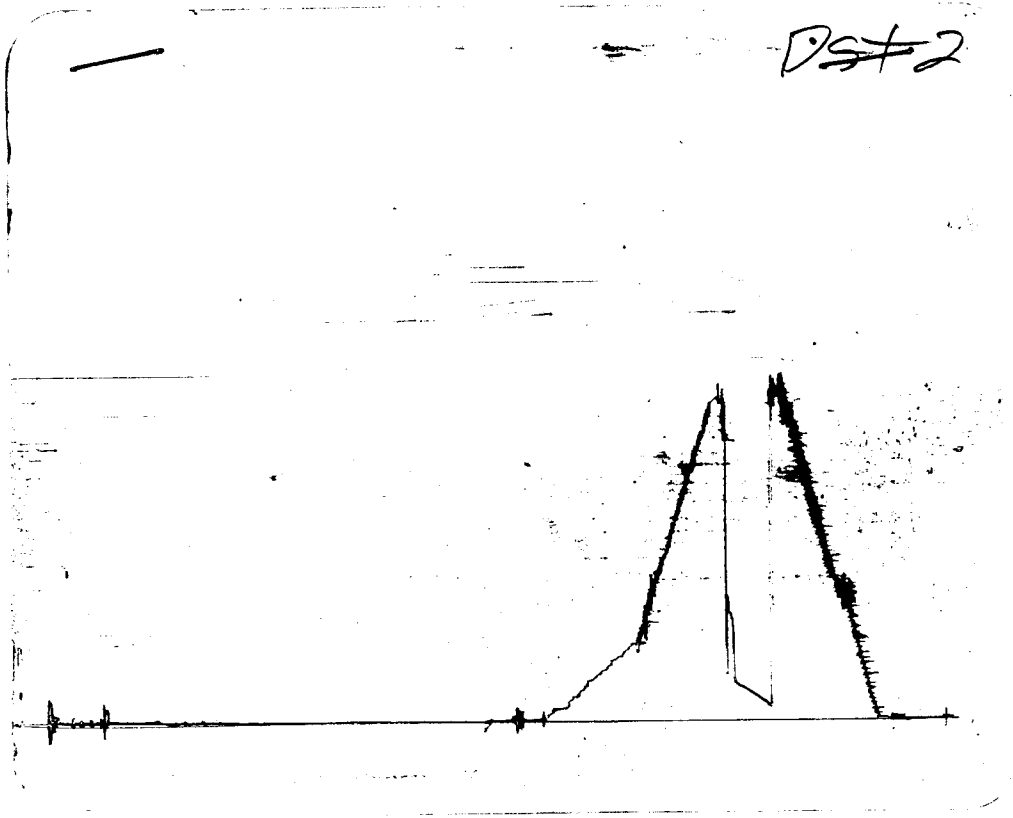
(H) Final Hydrostatic Mud 1968.6 PSI Initial Shut-in 30 Final Shut-in 30

Our Representative MARK HERSKOWITZ TOTAL PRICE \$ 550



POINT This is an actual photograph of recorder chart PRESSURE

POINT	FIELD READING	OFFICE READING
(A) INITIAL HYDROSTATIC MUD	2018	2016.9
(B) FIRST INITIAL FLOW PRESSURE	55	64.9
(C) FIRST FINAL FLOW PRESSURE	225	225.7
(D) INITIAL CLOSED-IN PRESSURE	761	783.1
(E) SECOND INITIAL FLOW PRESSURE	256	277.5
(F) SECOND FINAL FLOW PRESSURE	369	377.2
(G) FINAL CLOSED-IN PRESSURE	761	773.52
(H) FINAL HYDROSTATIC MUD	1968	1968.6



POINT This is an actual photograph of recorder chart PRESSURE

FIELD  
READING

OFFICE  
READING

- (A) INITIAL HYDROSTATIC MUD
- (B) FIRST INITIAL FLOW PRESSURE
- (C) FIRST FINAL FLOW PRESSURE
- (D) INITIAL CLOSED-IN PRESSURE
- (E) SECOND INITIAL FLOW PRESSURE
- (F) SECOND FINAL FLOW PRESSURE
- (G) FINAL CLOSED-IN PRESSURE
- (H) FINAL HYDROSTATIC MUD

COMPUTER EVALUATION BY TRILOBITE TESTING  
CASTLE RESOURCES  
REPORT FOR DST#2 FOR THE ZIEGENBALG #1  
01 15S 30W GOVE KS

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TEST PARAMETERS

ELEVATION: 2629 KB EST. PAY: 6 FT  
DATUM: -1507 ZONE TESTED: MYRICH STATION  
TEST INTERVAL: 4110-4200  
RECORDER DEPTH: 4135 TIME INTERVALS: 30-30-30-30  
BOTTOM HOLE TEMP: 123 VISCOSITY: 6.346522 CP  
HOLE SIZE: 7.875 IN

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CALCULATIONS

CUBIC FEET OF GAS IN PIPE: 96.44598  
TOTAL FEET OF RECOVERY: 1000  
BARRELS IN DRILL PIPE: 14.22  
GAS OIL RATIO: 6.782418 CU.FT./BBL  
BUBBLE POINT PRESSURE: ; .9613085  
TOTAL BARRELS OF RECOVERY: 14.22  
API GRAVITY: 33  
CORRECTED PIPE FILLUP: 1011.26  
INITIAL PRODUCTION CORRECTED TO FINAL FLOW PRESSURE: 345.1228 BBL/DAY  
INITIAL PRODUCTION CORRECTED TO PSEUDO STEADY FLOW STATE  
242.3952

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INITIAL SLOPE 190.51 PSI/CYCLE  
INITIAL P\* 840 PSI

FINAL SLOPE 133.37 PSI/CYCLE  
FINAL P\* 837 PSI

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TRANSMISSIBILITY 420.7617 (MD.-FT./CP.)  
PERMEABILITY 445.0622 (MD.)  
INDICATED FLOW CAPACITY 2670.373 (MD.FT)  
PRODUCTIVITY INDEX .4754607 (BARRELS/DAY/PSI)  
DAMAGE RATIO .630902  
RADIUS OF INVESTIGATION 163.4128 (FT.)  
POTENTIOMETRIC SURFACE 435.003 (FT.)  
DRAWDOWN FACTOR .3571451 (%)



INITIAL FLOW

RECORDED # 2023  
DST #2

DT(MIN)	PRESSURE	< > PRESSURE
0	64.9	64.9
3	76.8	11.9
6	96.3	19.5
9	117.9	21.6
12	132.9	14.99999
15	149.9	17
18	166.9	17
21	181.7	14.8
24	196.4	14.7
27	209.1	12.70001
30	225.7	16.59999

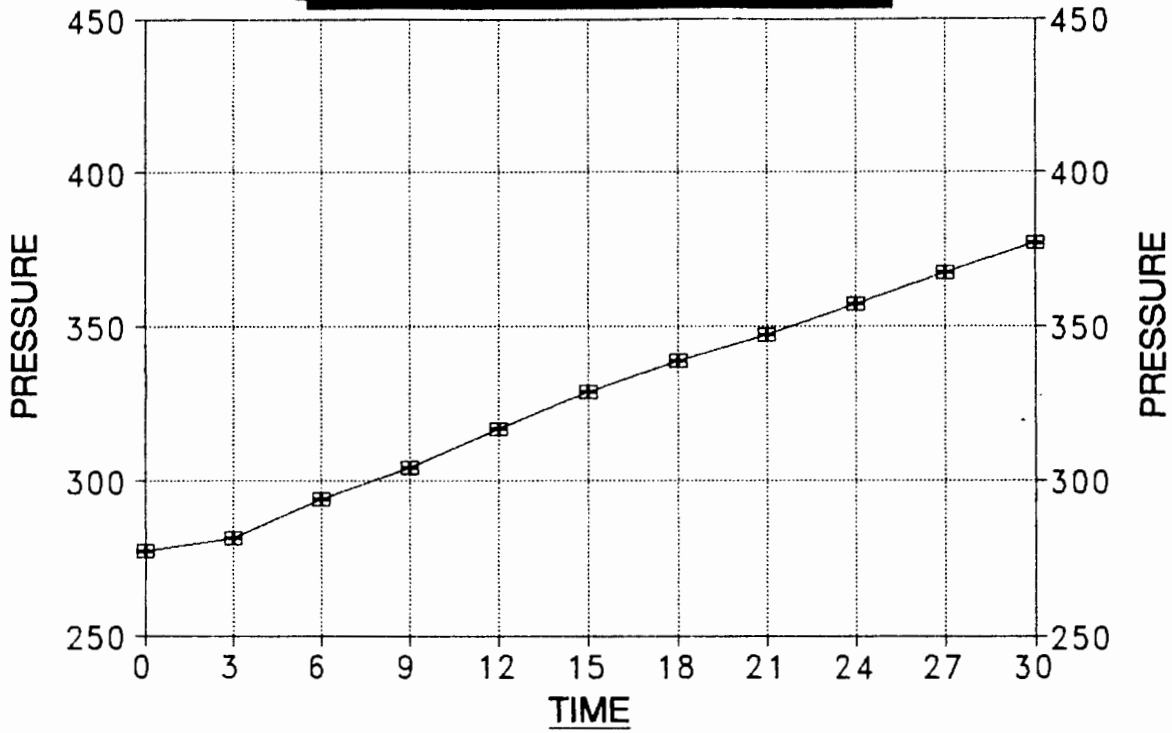
FINAL FLOW

RECORDED # 2023  
DST #2

DT(MIN)	PRESSURE	< > PRESSURE
0	377.2	377.2
3	663.2	286
6	700.1	36.89996
9	721.3	21.20001
12	727.1	5.799988
15	746.4	19.30005
18	752.2	5.799988
21	758.1	5.899964
24	763.8	5.700012
27	767.7	3.900025
30	773.5	5.799988

# DELTA T DELTA P

FINAL FLOW - DST #2



INITIAL PRODUCTION CORRECTED TO PSEUDO STEADY FLOW STATE 242.3952 BBL/DAY

INITIAL DST #2  
SHUTIN  
30 INITIAL FLOW TIME

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Slope -190.51 psi/cycle  
P \* 840 psi  
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	TIME(MIN)	Pws (psi)	Horn T	Log Horn T	<> PRESSURE
	3	634.1	11	1.041	634.1
	6	690.4	6	0.778	56.3
	9	719.4	4	0.637	29.0
X	12	736.8	4	0.544	17.4
	15	750.3	3	0.477	13.5
	18	760.1	3	0.426	9.8
	21	769.6	2	0.385	9.5
	24	773.5	2	0.352	3.9
	27	779.3	2	0.325	5.8
x	30	783.1	2	0.301	3.8

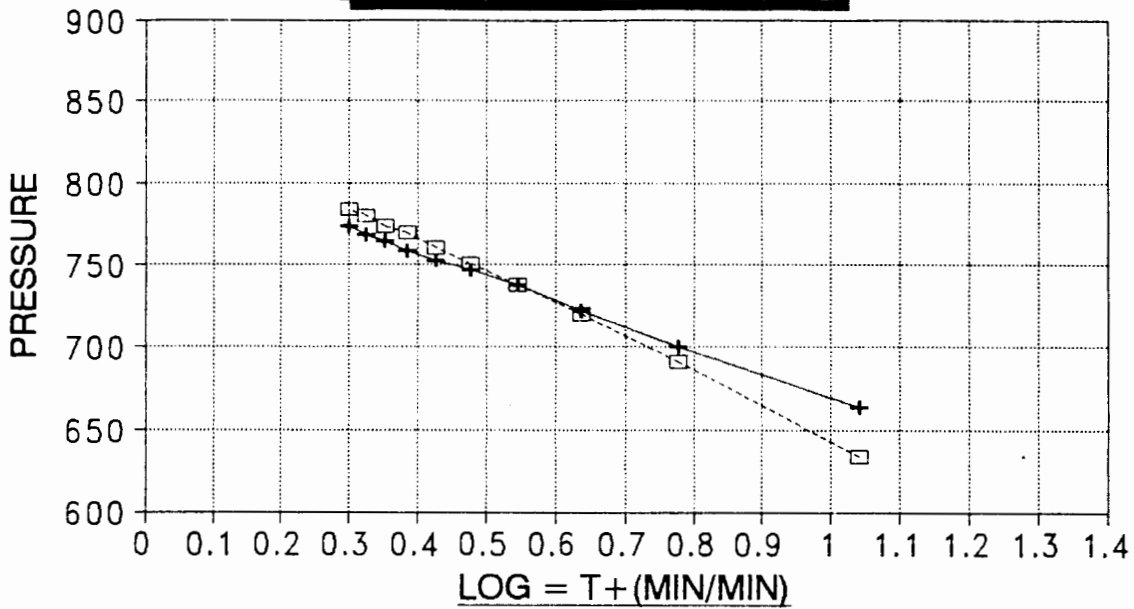
FINAL DST #2  
SHUTIN  
60 TOTAL FLOW TIME

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Slope -133.37 psi/cycle  
P \* 837 psi  
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	TIME(MIN)	Pws (psi)	Horn T	Log Horn T	<> PRESSURE
	3	663.2	21	1.322	663.2
	6	700.1	11	1.041	36.9
	9	721.3	8	0.885	21.2
	12	737.1	6	0.778	15.8
	15	746.4	5	0.699	9.3
X	18	752.2	4	0.637	5.8
	21	758.1	4	0.586	5.9
	24	763.8	4	0.544	5.7
	27	767.7	3	0.508	3.9
X	30	773.5	3	0.477	5.8

# HORNER PLOT

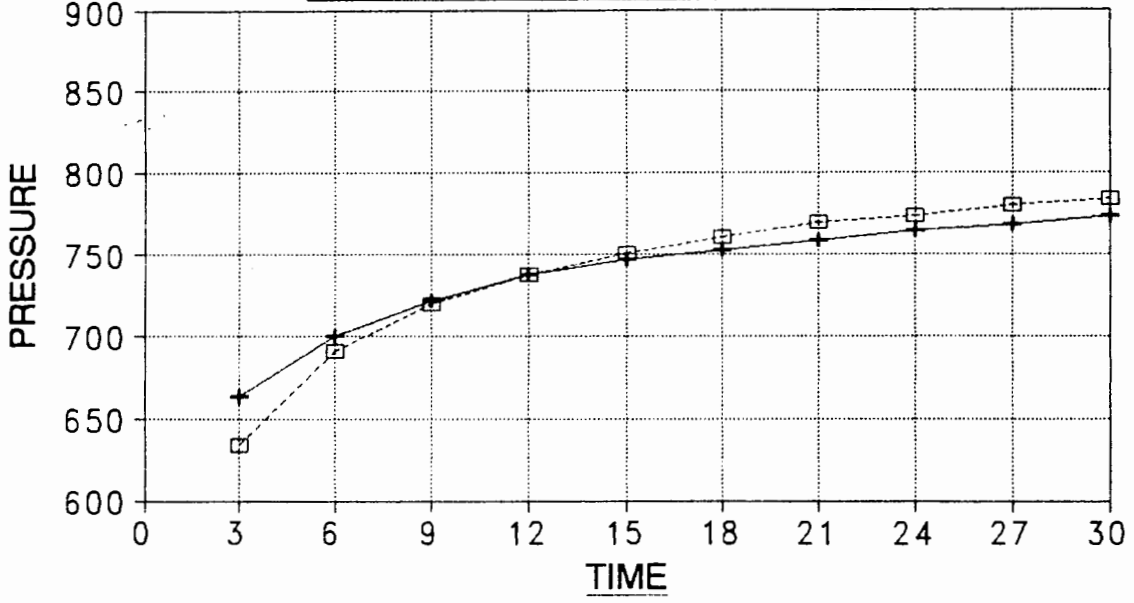
## ZIEGENBALG #1



---□--- INITIAL    +--- FINAL

# DELTA T DELTA P

## ZIEGENBALG #1



---□--- INITIAL    +--- FINAL

# TRILOBITE TESTING COMPANY

P.O. Box 362 • Hays, Kansas 67601

## Test Ticket

No. 3987

Well Name & No. ZIEGENBach 1# Test No. 2 Date 10-9-91  
 Company CASTLE RES Zone Tested Myrich Station  
 Address BOX 90 HAYS Elevation 2629  
 Co. Rep./Geo. JERRY GREEN Cont. EMPHASIS RYE Est. Ft. of Pay 6  
 Location: Sec. 01 Twp. 15S Rge. 30W Co. GOVE State KS  
 No. of Copies \_\_\_\_\_ Distribution Sheet \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ Turnkey \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ Evaluation \_\_\_\_\_

Interval Tested 4110 - 4200 Drill Pipe Size 4 1/2 XH  
 Anchor Length 90 Top Choke — 1" \_\_\_\_\_ Bottom Choke — 1/4" \_\_\_\_\_  
 Top Packer Depth 4103 Hole Size — 7 7/8" \_\_\_\_\_ Rubber Size — 6 3/4" \_\_\_\_\_  
 Bottom Packer Depth 4110 Wt. Pipe I.D. — 2.7 Ft. Run \_\_\_\_\_  
 Total Depth 4200 Drill Collar — 2.25 Ft. Run \_\_\_\_\_  
 Mud Wt. 9.3 LOM TR lb/gal. Viscosity 44 Filtrate 10.6  
 Tool Open @ 1143 AM Initial Blow Good Flow OFF BOTTOM IN 1 MIN  
45 sec

Final Blow OFF BOTTOM 1 MIN 15 SEC  
OFF BOTTOM IN 5 MIN SHUT-IN

Recovery — Total Feet 1000 Feet of Gas in Pipe 1208 Flush Tool? \_\_\_\_\_

Rec.	Feet Of	% gas	% oil	% water	% mud
<u>1000</u>	<u>MUD COIL</u>	<u>10</u>	<u>80</u>	<u>10</u>	<u>10</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

BHT 123 °F Gravity 35 °API @ 80 °F Corrected Gravity 33 °API  
 RW \_\_\_\_\_ @ \_\_\_\_\_ °F Chlorides \_\_\_\_\_ ppm Recovery Chlorides 3100 ppm System

(A) Initial Hydrostatic Mud 2018 PSI AK1 Recorder No. 13308 Range 4000  
 (B) First Initial Flow Pressure 55 PSI @ (depth) 4112 w/Clock No. 27573  
 (C) First Final Flow Pressure 225 PSI AK1 Recorder No. 2023 Range 4000  
 (D) Initial Shut-In Pressure 761 PSI @ (depth) 4135 w/Clock No. 8376  
 (E) Second Initial Flow Pressure 250 PSI AK1 Recorder No. \_\_\_\_\_ Range \_\_\_\_\_  
 (F) Second Final Flow Pressure 369 PSI @ (depth) \_\_\_\_\_ w/Clock No. \_\_\_\_\_  
 (G) Final Shut-In Pressure 761 PSI Initial Opening 30 Test   
 (H) Final Hydrostatic Mud 1968 PSI Initial Shut-In 30 Jars \_\_\_\_\_

Final Flow 30 Safety Joint \_\_\_\_\_  
 Final Shut-In 30 Straddle \_\_\_\_\_  
 Circ. Sub  NC  
 Sampler \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  
 Other \_\_\_\_\_

Approved By \_\_\_\_\_  
 Our Representative Mark Harsanyi

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