

TRILOBITE TESTING, L.L.C.

P.O. Box 362 • Hays, Kansas 67601

Drill-Stem Test Data

Well Name AMREIN #1 Test No. 1 Date 5/11/92
Company DECAB COMPANY Zone LKC-"A-B-C"
Address BOX 609 HAYS KANSAS 67601 Elevation 1996
Co. Rep./Geo. RON NELSON Cont. EMPHASIS RIG #6 Est. Ft. of Pay 7
Location: Sec. 33 Twp. 8S Rge. 19W Co. ROOKS State KS

Interval Tested 3178-3240 Drill Pipe Size 4.5 XH
Anchor Length 62 Wt. Pipe I.D. - 2.7 Ft. Run
Top Packer Depth 3173 Drill Collar - 2.25 Ft. Run
Bottom Packer Depth 3178 Mud Wt. 9 lb/Gal.
Total Depth 3240 Viscosity 41 Filtrate 10.4

Tool Open @ 9:05 AM Initial Blow WEAK-BUILDING TO STRONG - OFF BOTTOM OF BUCKET
IN 11 MINUTES
Final Blow WEAK-BUILDING TO STRONG-OFF BOTTOM OF BUCKET
IN 23 MINUTES

Recovery - Total Feet 332 Flush Tool? NO

Rec. 154 Feet of GAS IN PIPE
Rec. 30 Feet of CLEAN OIL
Rec. 120 Feet of OIL CUT MUD-40%OIL/60%MUD
Rec. 62 Feet of SLTLY OIL CUT MUD-5%OIL/95%MUD
Rec. 120 Feet of MUDDY WATER-95%WTR/5%MUD

BHT 108 °F Gravity 86 °API @ °F Corrected Gravity 40 °API
RW 0.06 @ °F Chlorides 36000 ppm Recovery Chlorides 4000 ppm System

(A) Initial Hydrostatic Mud 1643.9 PSI AK1 Recorder No. 13754 Range 4000

(B) First Initial Flow Pressure 62.0 PSI @ (depth) 3182 w / Clock No. 8179

(C) First Final Flow Pressure 117.1 PSI AK1 Recorder No. 7437 Range 4200

(D) Initial Shut-in Pressure 715.4 PSI @ (depth) 3236 w / Clock No. 31152

(E) Second Initial Flow Pressure 144.6 PSI AK1 Recorder No. Range

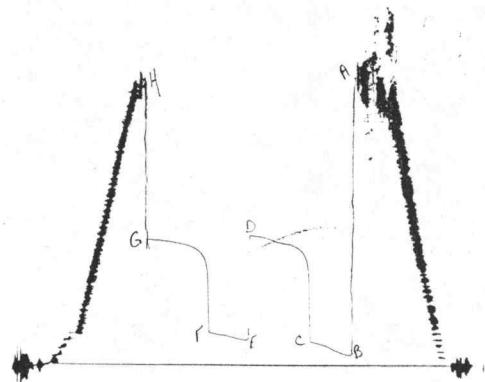
(F) Second Final Flow Pressure 181.1 PSI @ (depth) w / Clock No.

(G) Final Shut-in Pressure 702.5 PSI Initial Opening 30 Final Flow 30

(H) Final Hydrostatic Mud 1587.9 PSI Initial Shut-in 45 Final Shut-in 45

Our Representative DAN BANGLE

CHART PAGE



This is an actual photograph of recorder chart

	FIELD READING	OFFICE READING
(A) INITIAL HYDROSTATIC MUD	1686	1643.9
(B) FIRST INITIAL FLOW PRESSURE	78	62
(C) FIRST FINAL FLOW PRESSURE	118	117.1
(D) INITIAL CLOSED-IN PRESSURE	719	715.4
(E) SECOND INITIAL FLOW PRESSURE	147	144.6
(F) SECOND FINAL FLOW PRESSURE	187	181.1
(G) FINAL CLOSED-IN PRESSURE	709	702.5
(H) FINAL HYDROSTATIC MUD	1586	1587.9

COMPUTER EVALUATION BY TRILOBITE TESTING, L.L.C.

DECAB COMPANY

AMREIN #1

DST 1

33

8S

19W

ROOKS KS

ELEVATION: 1996 KB EST. PAY 7 FT

DATUM: -3183 ZONE TESTED: LKC-"A-B-C"

TEST INTERVAL: 3178-3240 TIME INTERVALS: 30-45-30-45

RECORDER DEPTH: 3182 VISCOSITY: 5.224 CP

BOTTOM HOLE TEMP: 108 HOLE SIZE: 7.875 IN

CUBIC FEET OF GAS IN PIPE: 12.30

TOTAL FEET OF RECOVERY: 332.00 CORRECTED PIPE FILLUP: 507.283

TOTAL BARRELS OF RECOVERY: 4.72 CORR. BARRELS OF RECOVERY: 7.210 BBL

BARRELS IN DRILL PIPE: 4.72 API GRAVITY: 40

BARRELS IN WEIGHT PIPE: 0.00 FLUID GRADIENT: 0.357

BARRELS IN DRILL COLLARS: 0.00

GAS OIL RATIO: 2.6044 CU.FT/BBL

BUBBLE POINT PRESSURE: 23.241

UNCORRECTED INITIAL PRODUCTION: 113.30 BBL

INITIAL PRODUCTION CORRECTED TO FINAL FLOW PRESSURE: 173.03 BBL/DAY

INITIAL PRODUCTION CORRECTED TO PSEUDO STEADY FLOW STATE: 38.776

INITIAL SLOPE 224.80 PSI/CYCLE FINAL SLOPE 163.09 PSI/CYCLE

INITIAL P* 765 PSI FINAL P* 763 PSI

TRANSMISSIBILITY 172.51 (MD.-FT./CP.)

PERMEABILITY 128.75 (MD.)

INDICATED FLOW CAPACITY 901.23 (MD.FT)

PRODUCTIVITY INDEX 0.19 (BARRELS/DAY/PSI)

DAMAGE RATIO 0.65

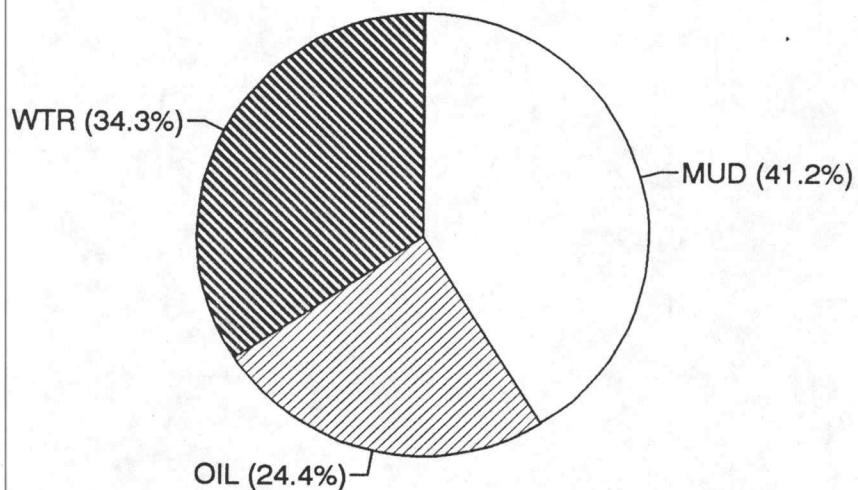
RADIUS OF INVESTIGATION 87.89 (FT,)

POTENTIOMETRIC SURFACE -1413.73 (FT.)

DRAWDOWN FACTOR 0.361 (%)

DST #	CALCULATED RECOVERY ANALYSIS					DRILL	PIPE		
	1	TICKET				4764			
SAMPLE #	TOTAL FEET	GAS %	OIL		WATER		MUD		
			FEET	%	FEET	%	FEET	%	FEET
1	30	0	0	100	30	0	0	0	0
2	120	0	0	40	48	0	0	60	72
3	62	0	0	5	3.1	0	0	95	58.9
4	120	0	0	0	0	95	114	5	6
5			0		0		0		0
TOTAL	332	0	0	24.4	81.1	34.337349	114	41.2	136.9

			HRS	BBL/DAY
BBL OIL=	1.153242	*	1	27.678
BBL WATER=	1.62108	*		38.906
BBL MUD=	1.946718			
BBL GAS	0			



INITIAL FLOW

RECORDER 13754

DST # 1

TIME(MIN)PRESSURE <>PRESSURE

0	62	62
3	64.9	2.9
6	68.9	4
9	74.8	5.9
12	81.6	6.8
15	87.6	6
18	93.5	5.9
21	100.3	6.8
24	108.2	7.9
27	111.2	3
30	117.1	5.9

FINAL FLOW

RECORDER # 13754

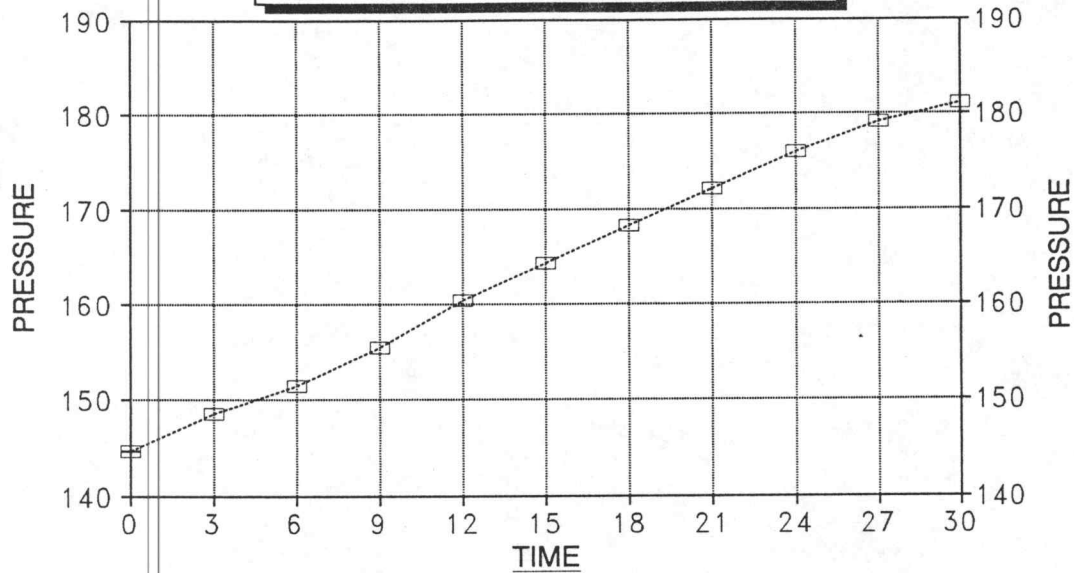
DST # 1

TIME(MIN). PRESSURE <> PRESSURE

0	144.6	144.6
3	148.6	4
6	151.5	2.9
9	155.5	4
12	160.4	4.9
15	164.3	3.9
18	168.3	4
21	172.2	3.9
24	176	3.8
27	179.1	3.1
30	181.1	2

DELTA T DELTA P

FINAL FLOW - DST #1



---□--- AMREIN #1

INITIAL PRODUCTION CORRECTED TO PSEUDO STEADY FLOW STATE:

38.776

AMREIN #1
INITIAL

DST #1
SHUTIN
30 FLOW TIME

Slope 224.80 psi/cycle
P * 765 psi

X

X

	Pws (psi)	Log Horn T	<> PRESSURE	Horn T
3	539.5	1.041	539.5	11
6	616.5	0.778	77.0	6
9	642.2	0.637	25.7	4
12	655.1	0.544	12.9	4
15	664.0	0.477	8.9	3
18	671.9	0.426	7.9	3
21	680.8	0.385	8.9	2
24	686.7	0.352	5.9	2
27	691.6	0.325	4.9	2
30	697.6	0.301	6.0	2
33	701.5	0.281	3.9	2
36	705.5	0.263	4.0	2
39	709.4	0.248	3.9	2
42	713.4	0.234	4.0	2
45	715.4	0.222	2.0	2

AMREIN #1
FINAL

DST #1
SHUTIN
60 TOTAL FLOW TIME

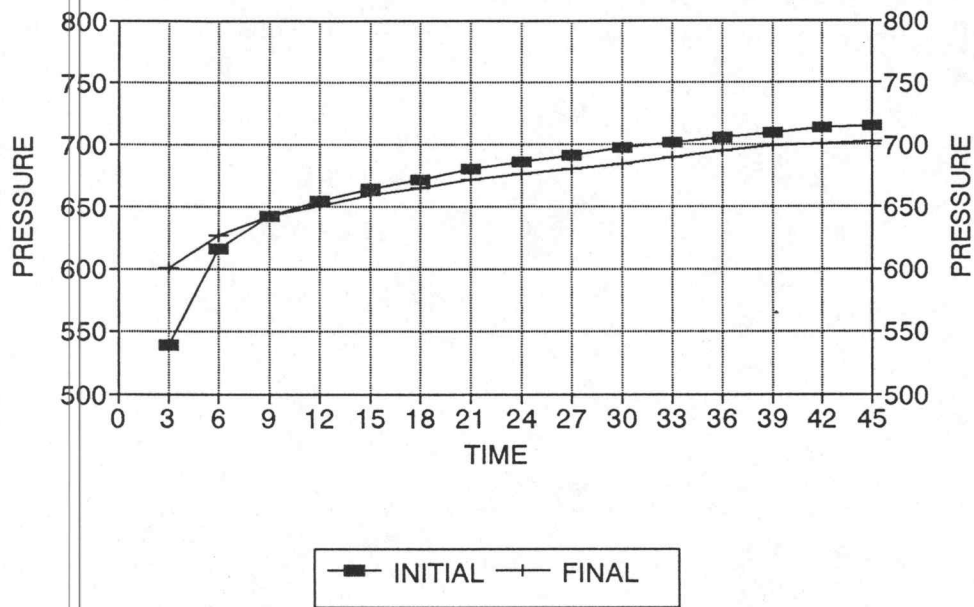
Slope 163.09 psi/cycle
P * 763 psi

X

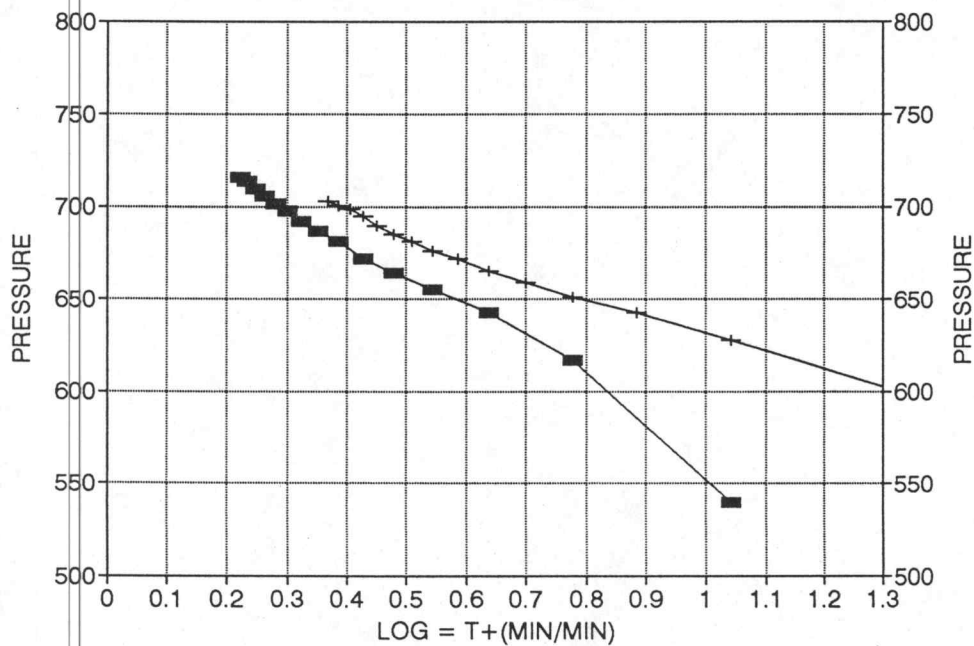
X

TIME(MIN)	Pws (psi)	Log Horn T	<> PRESSURE	Horn T
3	600.7	1.322	600.7	21
6	627.4	1.041	26.7	11
9	642.2	0.885	14.8	8
12	651.1	0.778	8.9	6
15	659.0	0.699	7.9	5
18	665.0	0.637	6.0	4
21	671.9	0.586	6.9	4
24	675.8	0.544	3.9	4
27	680.8	0.508	5.0	3
30	684.7	0.477	3.9	3
33	689.7	0.450	5.0	3
36	694.6	0.426	4.9	3
39	698.6	0.405	4.0	3
42	700.5	0.385	1.9	2
45	702.5	0.368	2.0	2

AMREIN #1 / DST #1 DELTA T DELTA P



HORNER PLOT



TRILOBITE TESTING, L.L.C.

P.O. Box 362 • Hays, Kansas 67601

Drill-Stem Test Data

Well Name AMREIN #1 Test No. 2 Date 5/11/92
Company DECAB COMPANY Zone LKC - "E-F-G"
Address BOX 609 HAYS KANSAS 67601 Elevation 1996
Co. Rep./Geo. RON NELSON Cont. EMPHASIS RIG #6 Est. Ft. of Pay _____
Location: Sec. 33 Twp. 8S Rge. 19W Co. ROOKS State KS

Interval Tested	<u>3251-3300</u>	Drill Pipe Size	<u>4.5 XH</u>
Anchor Length	<u>49</u>	Wt. Pipe I.D. - 2.7 Ft. Run	_____
Top Packer Depth	<u>3246</u>	Drill Collar - 2.25 Ft. Run	_____
Bottom Packer Depth	<u>3251</u>	Mud Wt.	<u>9.2</u> lb/Gal.
Total Depth	<u>3300</u>	Viscosity	<u>43</u>
		Filtrate	<u>10.4</u>

Tool Open @ 11:07 PM Initial Blow WEAK - BUILDING TO 6" FAIR BLOW
Final Blow WEAK-BUILDING TO 2"

Recovery - Total Feet 150 Flush Tool? NO

Rec. <u>5</u>	Feet of	<u>CLEAN OIL</u>
Rec. <u>145</u>	Feet of	<u>MUDDY WATER</u>
Rec. _____	Feet of	_____
Rec. _____	Feet of	_____
Rec. _____	Feet of	_____

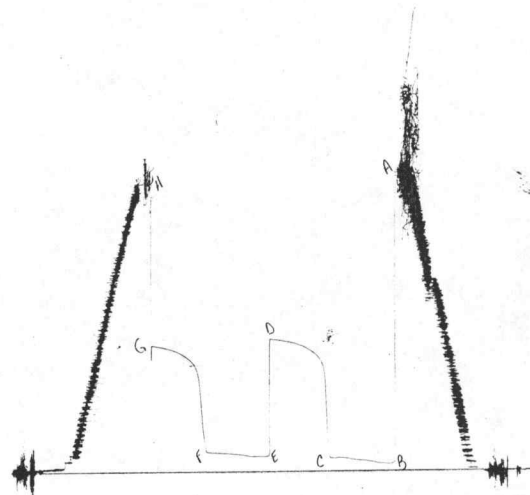
BHT 109 °F Gravity _____ °API @ _____ °F Corrected Gravity _____ °API
RW 0.04 @ _____ °F Chlorides 32000 ppm Recovery Chlorides 3000 ppm System

(A) Initial Hydrostatic Mud	<u>1704.5</u> PSI	AK1 Recorder No.	<u>13754</u>	Range	<u>4000</u>
(B) First Initial Flow Pressure	<u>62.3</u> PSI	@ (depth)	<u>3255</u>	w / Clock No.	<u>8179</u>
(C) First Final Flow Pressure	<u>85.6</u> PSI	AK1 Recorder No.	<u>7437</u>	Range	<u>4200</u>
(D) Initial Shut-in Pressure	<u>734.9</u> PSI	@ (depth)	<u>3296</u>	w / Clock No.	<u>31152</u>
(E) Second Initial Flow Pressure	<u>94.5</u> PSI	AK1 Recorder No.	_____	Range	_____
(F) Second Final Flow Pressure	<u>102.3</u> PSI	@ (depth)	_____	w / Clock No.	_____
(G) Final Shut-in Pressure	<u>684.5</u> PSI	Initial Opening	<u>45</u>	Final Flow	<u>45</u>
(H) Final Hydrostatic Mud	<u>1620.4</u> PSI	Initial Shut-in	<u>45</u>	Final Shut-in	<u>45</u>

Our Representative DAN BANGLE

CHART PAGE

74/37 #12



This is an actual photograph of recorder chart

	FIELD READING	OFFICE READING
(A) INITIAL HYDROSTATIC MUD	1696	1704.5
(B) FIRST INITIAL FLOW PRESSURE	59	62.3
(C) FIRST FINAL FLOW PRESSURE	78	85.6
(D) INITIAL CLOSED-IN PRESSURE	729	734.9
(E) SECOND INITIAL FLOW PRESSURE	88	94.5
(F) SECOND FINAL FLOW PRESSURE	98	102.3
(G) FINAL CLOSED-IN PRESSURE	679	684.5
(H) FINAL HYDROSTATIC MUD	1616	1620.4

TRILOBITE TESTING, L.L.C.

P.O. Box 362 • Hays, Kansas 67601

Drill-Stem Test Data

Well Name AMREIN #1 Test No. 3 Date 5/12/92
Company DECAB COMPANY Zone LKC-"I-J"
Address BOX 609 HAYS KANSAS 67601 Elevation 1996
Co. Rep./Geo. RON NELSON Cont. EMPHASIS RIG #6 Est. Ft. of Pay _____
Location: Sec. 33 Twp. 8S Rge. 19W Co. ROOKS State KS

Interval Tested	<u>3330-3370</u>	Drill Pipe Size	<u>4.5 XH</u>
Anchor Length	<u>40</u>	Wt. Pipe I.D. - 2.7 Ft. Run	_____
Top Packer Depth	<u>3325</u>	Drill Collar - 2.25 Ft. Run	_____
Bottom Packer Depth	<u>3330</u>	Mud Wt. _____	<u>9</u> lb/Gal.
Total Depth	<u>3370</u>	Viscosity <u>49</u>	Filtrate <u>8</u>

Tool Open @ 1:34 PM Initial Blow WEAK-BUILDING TO STRONG-BOTTOM OF BUCKET IN 12
MINUTES

Final Blow WEAK-BUILDING TO 8" FAIR BLOW

Recovery - Total Feet 392 Flush Tool? NO

Rec. <u>2</u>	Feet of	<u>CLEAN OIL</u>
Rec. <u>390</u>	Feet of	<u>WATER</u>
Rec. _____	Feet of	<u>0</u>
Rec. _____	Feet of	_____
Rec. _____	Feet of	<u>0</u>

BHT 109 °F Gravity _____ °API @ _____ °F Corrected Gravity _____ °API
RW 0.06 @ 86 °F Chlorides 38000 ppm Recovery Chlorides 5000 ppm System

(A) Initial Hydrostatic Mud 1705.6 PSI AK1 Recorder No. 13754 Range 4000

(B) First Initial Flow Pressure 22.5 PSI @ (depth) 3334 w / Clock No. 8179

(C) First Final Flow Pressure 94.5 PSI AK1 Recorder No. 7437 Range 4200

(D) Initial Shut-in Pressure 771.2 PSI @ (depth) 3366 w / Clock No. 31152

(E) Second Initial Flow Pressure 115.6 PSI AK1 Recorder No. _____ Range _____

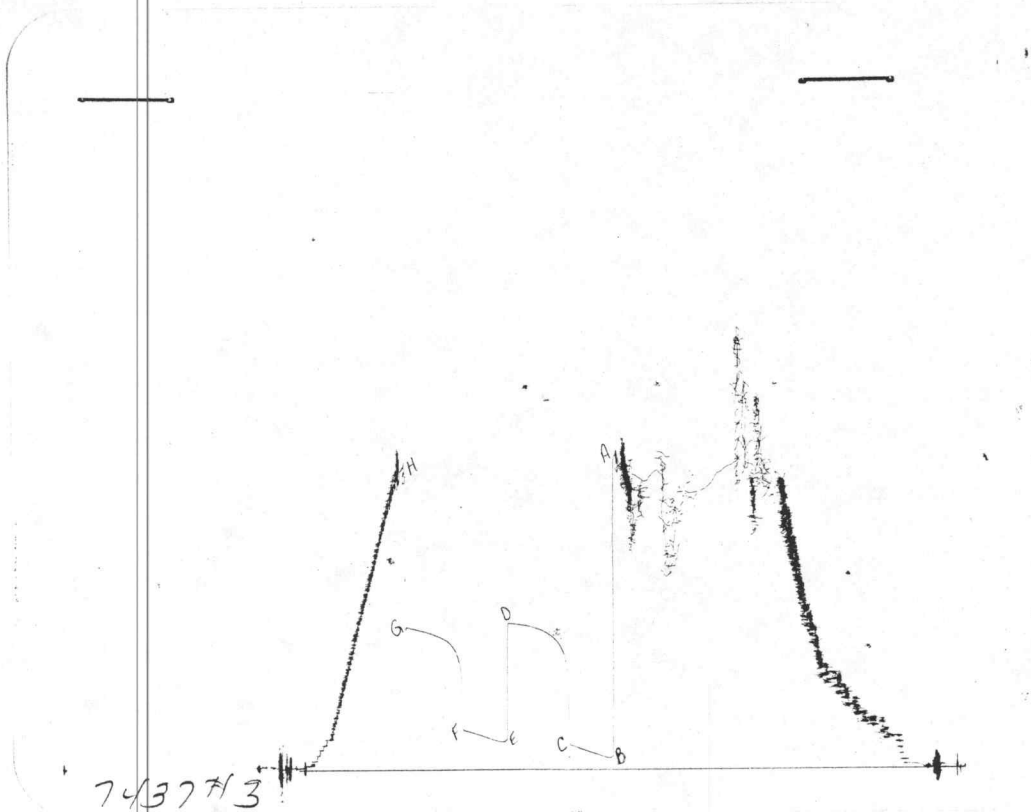
(F) Second Final Flow Pressure 184.9 PSI @ (depth) _____ w / Clock No. _____

(G) Final Shut-in Pressure 755.2 PSI Initial Opening 30 Final Flow 30

(H) Final Hydrostatic Mud 1640.9 PSI Initial Shut-in 45 Final Shut-in 45

Our Representative DAN BANGLE

CHART PAGE



This is an actual photograph of recorder chart

	FIELD READING	OFFICE READING
(A) INITIAL HYDROSTATIC MUD	1696	1705.6
(B) FIRST INITIAL FLOW PRESSURE	19	22.5
(C) FIRST FINAL FLOW PRESSURE	88	94.5
(D) INITIAL CLOSED-IN PRESSURE	768	771.2
(E) SECOND INITIAL FLOW PRESSURE	108	115.6
(F) SECOND FINAL FLOW PRESSURE	177	184.9
(G) FINAL CLOSED-IN PRESSURE	749	755.2
(H) FINAL HYDROSTATIC MUD	1636	1640.9

TRILOBITE TESTING, L.L.C.

P.O. Box 362 • Hays, Kansas 67601

Drill-Stem Test Data

Well Name AMREIN #1 Test No. 4 Date 5/13/92
Company DECAB COMPANY Zone ARBUCKLE
Address BOX 609 HAYS KANSAS 67601 Elevation 1996
Co. Rep./Geo. RON NELSON Cont. EMPHASIS RIG #6 Est. Ft. of Pay _____
Location: Sec. 33 Twp. 8S Rge. 19W Co. ROOKS State KS

Interval Tested 3429-3436 Drill Pipe Size 4.5 XH
Anchor Length 7 Wt. Pipe I.D. - 2.7 Ft. Run _____
Top Packer Depth 3424 Drill Collar - 2.25 Ft. Run _____
Bottom Packer Depth 3429 Mud Wt. 9 lb/Gal.
Total Depth 3436 Viscosity 49 Filtrate 8

Tool Open @ 3:13 AM Initial Blow STRONG-BOTTOM OF BUCKET IN 30 SECONDS

Final Blow STRONG - BOTTOM OF BUCKET IN 15 SECONDS

Recovery - Total Feet 2480 Flush Tool? NO

Rec. 120 Feet of GAS IN PIPE
Rec. 1240 Feet of OIL & MUD CUT WTR-25%OIL/40%WTR/35%MUD
Rec. 310 Feet of OIL & SLTLY MUD CUT WTR-20%OIL/75%WTR/5%MUD
Rec. 620 Feet of SLTLY OIL CUT WTR-5%OIL/95%WTR
Rec. 310 Feet of WATER

BHT 114 °F Gravity _____ °API @ _____ °F Corrected Gravity _____ °API
RW 0.07 @ 82 °F Chlorides 28000 ppm Recovery Chlorides 5000 ppm System

(A) Initial Hydrostatic Mud 1833.7 PSI AK1 Recorder No. 13754 Range 4000

(B) First Initial Flow Pressure 336.9 PSI @ (depth) 3420 w / Clock No. 8179

(C) First Final Flow Pressure 921.4 PSI AK1 Recorder No. 7437 Range 4200

(D) Initial Shut-in Pressure 1117.8 PSI @ (depth) 3432 w / Clock No. 31152

(E) Second Initial Flow Pressure 997.6 PSI AK1 Recorder No. _____ Range _____

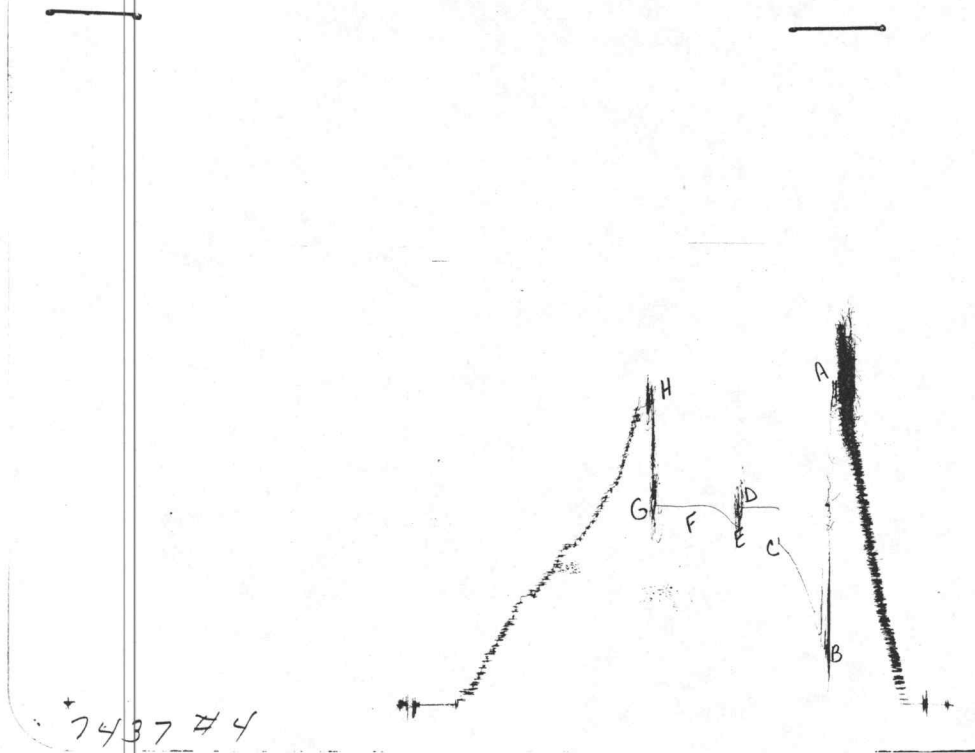
(F) Second Final Flow Pressure 1116.9 PSI @ (depth) _____ w / Clock No. _____

(G) Final Shut-in Pressure 1116.9 PSI Initial Opening 30 Final Flow 30

(H) Final Hydrostatic Mud 1760.2 PSI Initial Shut-in 30 Final Shut-in 30

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CHART PAGE



This is an actual photograph of recorder chart

	FIELD READING	OFFICE READING
(A) INITIAL HYDROSTATIC MUD	1820	1833.7
(B) FIRST INITIAL FLOW PRESSURE	330	336.9
(C) FIRST FINAL FLOW PRESSURE	915	921.4
(D) INITIAL CLOSED-IN PRESSURE	1104	1117.8
(E) SECOND INITIAL FLOW PRESSURE	999	997.6
(F) SECOND FINAL FLOW PRESSURE	1114	1116.9
(G) FINAL CLOSED-IN PRESSURE	1114	1116.9
(H) FINAL HYDROSTATIC MUD	1757	1760.2