

31-31s-39W

KCC

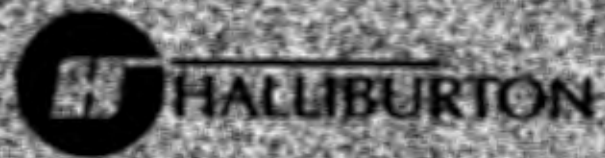
ORIGINAL

JUL 9 1996

Computer inventoried

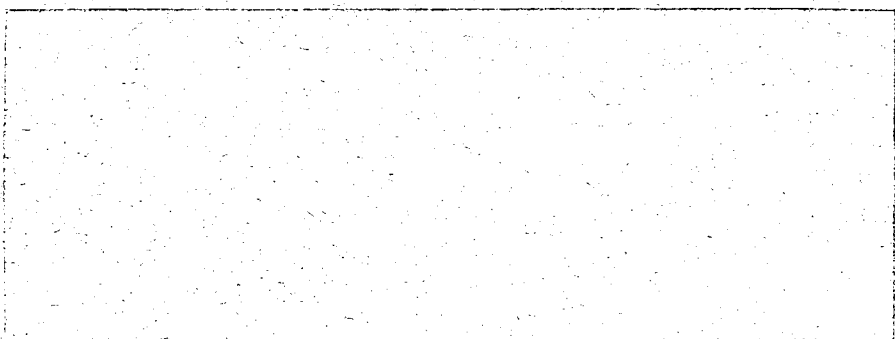
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INDUSTRIAL CORPORATION COMMISSION  
MAY 22 1996  
CORPORATION DIVISION  
WICHITA, KS

# DRILL STEM TEST REPORT



# NOMENCLATURE

- B** = Formation Volume Factor ..... (Res Vol/Std Vol)  
**c<sub>g</sub>** = System Total Compressibility ..... (Vol/Vol)/psi  
**DR** = Damage Ratio  
**h** = Estimated Net Pay Thickness ..... Ft



- k** = Permeability ..... md  
**m** { = (Liquid) Slope Extrapolated Pressure Plot ..... psi/cycle  
       = (Gas) Slope Extrapolated m(P) Plot ..... MM psi<sup>2</sup>/cp/cycle  
**m(P\*)** = Real Gas Potential at P\* ..... MM psi<sup>2</sup>/cp  
**m(P<sub>i</sub>)** = Real Gas Potential at P<sub>i</sub> ..... MM psi<sup>2</sup>/cp  
**AOF<sub>1</sub>** = Maximum Indicated Absolute Open Flow at Test Conditions ... MCFD  
**AOF<sub>2</sub>** = Minimum Indicated Absolute Open Flow at Test Conditions .... MCFD  
**P\*** = Extrapolated Static Pressure ..... Psig  
**P<sub>i</sub>** = Final Flow Pressure ..... Psig  
**Q** = Liquid Production Rate During Test ..... BPD  
**Q<sub>1</sub>** = Theoretical Liquid Production w/Damage Removed ..... BPD  
**Q<sub>g</sub>** = Measured Gas Production Rate ..... MCFD  
**r<sub>i</sub>** = Approximate Radius of Investigation ..... Ft  
**r<sub>w</sub>** = Radius of Well Bore ..... Ft  
**S** = Skin Factor  
**t** = Total Flow Time Previous to Closed-in ..... Minutes  
**Δt** = Closed-in Time at Data Point ..... Minutes  
**T** = Temperature Rankine ..... °R  
**φ** = Porosity (fraction)  
**μ** = Viscosity of Gas or Liquid ..... cp  
**Log** = Common Log

ORIGINAL

<p>AMOCO PRODUCTION COMPANY</p> <p>LEASE : MEREDITH JEANNE</p> <p>WELL NO. : 1-31</p> <p>TEST NO. : 1</p> <p>15-129-21355</p>
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TICKET NO. 70595500  
 27-DEC-94  
 LIBERAL

LEGAL LOCATION SEC - TWP - RNG	31 - 31 S - 39 W	FIELD AREA	EAST KINSLER	COUNTY	MORTON	STATE	KANSAS
LEASE NAME	MEREDITH JEANNE	WELL NO.	1-31	TEST NO.	1	TESTED INTERVAL	5753.6 - 5789.0
						LEASE OWNER/COMPANY NAME	AMOCO PRODUCTION COMPANY



GAUGE NO: 7352 DEPTH: 5733.0 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	2693	2772.2			
B	INITIAL FIRST FLOW	53	28.4			
C	FINAL FIRST FLOW	59	38.0	11.0	16.6	F
C	INITIAL FIRST CLOSED-IN	59	38.0			
D	FINAL FIRST CLOSED-IN	955	957.0	60.0	60.6	C
E	INITIAL SECOND FLOW	47	29.5			
F	FINAL SECOND FLOW	99	115.0	120.0	120.1	F
F	INITIAL SECOND CLOSED-IN	99	115.0			
G	FINAL SECOND CLOSED-IN	1179	1159.3	127.0	126.2	C
H	FINAL HYDROSTATIC	2693	2765.3			

## EQUIPMENT & HOLE DATA

FORMATION TESTED: LOWER MORROW  
 NET PAY (ft): 20.0  
 GROSS TESTED FOOTAGE: 35.4 PACKER TO T.D.  
 ALL DEPTHS MEASURED FROM: KB (11' AGL)  
 CASING PERFS. (ft): \_\_\_\_\_  
 HOLE OR CASING SIZE (in): 7.875  
 ELEVATION (ft): 3272.0 AT KELLY BUSHING  
 TOTAL DEPTH (ft): 5789.0  
 PACKER DEPTH(S) (ft): 5748, 5754  
 FINAL SURFACE CHOKE (in): 0.25000  
 BOTTOM HOLE CHOKE (in): 0.750  
 MUD WEIGHT (lb/gal): 9.20 (LSND)  
 MUD VISCOSITY (sec): 54  
 ESTIMATED HOLE TEMP. (°F): \_\_\_\_\_  
 ACTUAL HOLE TEMP. (°F): 136 @ 5784.1 ft

TICKET NUMBER: 70595500

DATE: 12-19-94 TEST NO: 1

TYPE DST: OPEN HOLE

FIELD CAMP:  
LIBERAL

TESTER: JEFF CLARK

WITNESS: SAM CARMACK

DRILLING CONTRACTOR:  
CHEYENNE DRILLING #3

## FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
<u>PIT</u>	<u>0.950 @ 48 °F</u>	<u>3509 ppm</u>
<u>SAMPLER</u>	<u>0.950 @ 48 °F</u>	<u>3509 ppm</u>
<u>TOP</u>	<u>0.950 @ 48 °F</u>	<u>3509 ppm</u>
<u>BTITDM</u>	<u>0.950 @ 48 °F</u>	<u>3509 ppm</u>
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm

## SAMPLER DATA

Psig AT SURFACE: 98.5  
 cu.ft. OF GAS: 0.457  
 cc OF OIL: \_\_\_\_\_  
 cc OF WATER: \_\_\_\_\_  
 cc OF MUD: 500.0  
 TOTAL LIQUID cc: 500.0

## HYDROCARBON PROPERTIES

OIL GRAVITY (°API): \_\_\_\_\_ @ \_\_\_\_\_ °F  
 GAS/OIL RATIO (cu.ft. per bbl): \_\_\_\_\_  
 GAS GRAVITY: \_\_\_\_\_

## CUSHION DATA

TYPE      AMOUNT      WEIGHT

\_\_\_\_\_  
 \_\_\_\_\_

### RECOVERED :

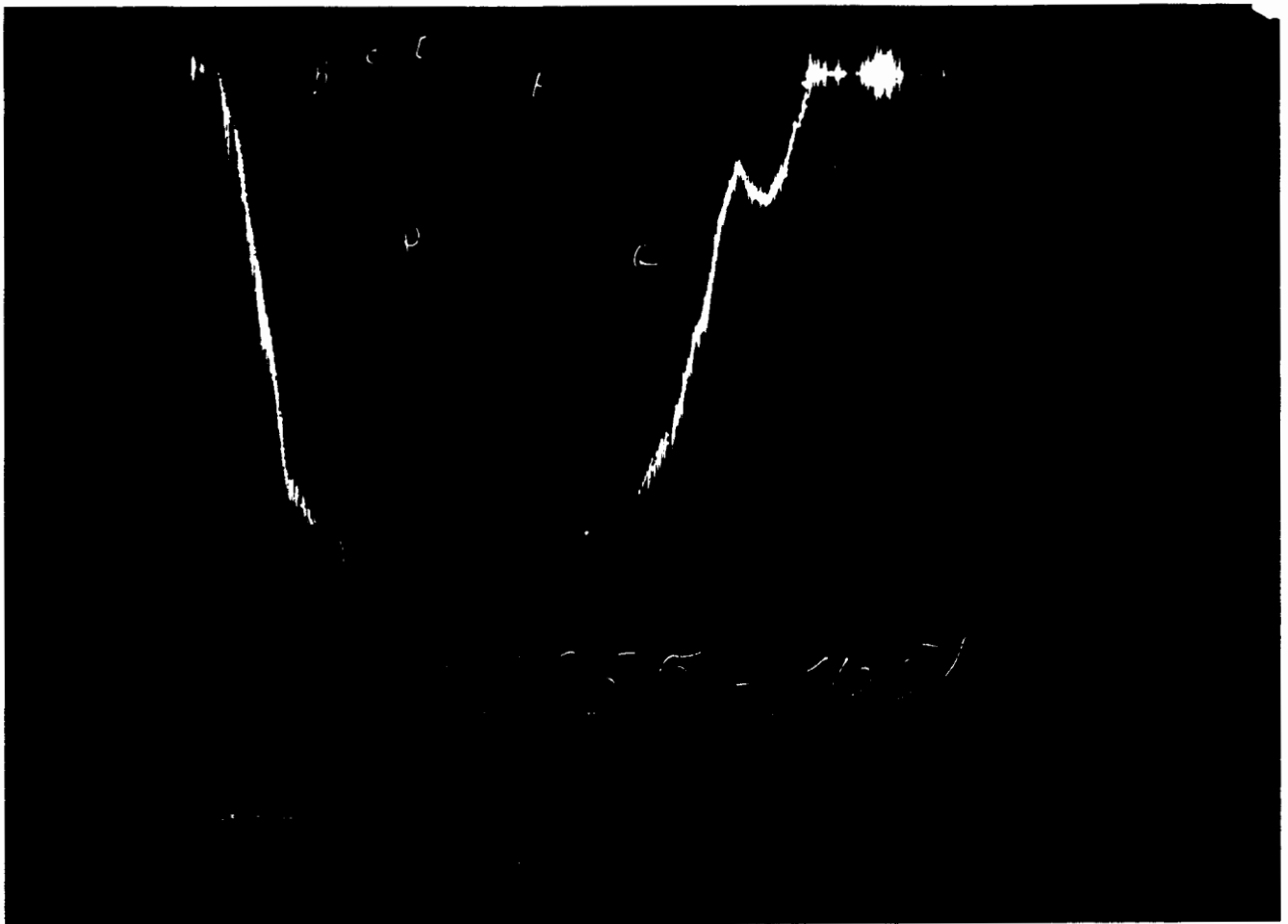
58 FEET OF GAS CUT DRILLING MUD  
 5650 FEET OF GAS

NOTE : THERE WAS DEFINITELY NO FORMATION WATER IN THE  
 RECOVERY SAMPLE .

MEASURED FROM  
TESTER VALVE

### REMARKS :

TOOLS WERE A LITTLE TIGHT COMING OFF BOTTOM.



GAUGE NO: 7351 DEPTH: 5785.7 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	2774	2801.5			
B	INITIAL FIRST FLOW	70	54.6			
C	FINAL FIRST FLOW	77	58.3	11.0	16.6	F
C	INITIAL FIRST CLOSED-IN	77	58.3			
D	FINAL FIRST CLOSED-IN	975	972.1	60.0	60.6	C
E	INITIAL SECOND FLOW	58	51.3			
F	FINAL SECOND FLOW	118	123.0	120.0	120.1	F
F	INITIAL SECOND CLOSED-IN	118	123.0			
G	FINAL SECOND CLOSED-IN	1176	1164.4	127.0	126.2	C
H	FINAL HYDROSTATIC	2773	2785.5			

TYPE & SIZE MEASURING DEVICE : 6" POSITIVE CHOKE				TICKET NO: 70595500	
TIME	CHOKE SIZE	SURFACE PRESSURE PSI	GAS RATE MCF	LIQUID RATE BPD	REMARKS
12-19-94					
0100					CALLED OUT
0500					ON LOCATION
					(RIG PULLING DRILL PIPE)
0540					STARTED GAUGES
0730					RIG ON BANK
0755					PICKED UP TOOLS
0830					TOOL MADE UP
0835					TRIPPED IN HOLE WITH DST #1
1030					RIGGED UP SURFACE EQUIPMENT
1037					STRING WEIGHT = 88,000#
					TOOL ON BOTTOM W/38,000#
1042					INCREASED WEIGHT TO 48,000#
1045					BLOW IN BUCKET
					ANNULUS HOLDING - STARTED 1ST
					FLOW
1048					BLOW OFF BOTTOM OF BUCKET
1056	BH	2.5			CLOSED TOOL FOR 1ST CIP
1156					OPENED TOOL
1157	BH				BLOW OFF BOTTOM OF BUCKET
1200	BH	33 OZ			58 OUNCE GAUGE
1205	BH	40 OZ			
1210	BH	50 OZ			
1212	BH	58 OZ			CHANGED OUT GAUGES
	BH	2.5			15 PSI GAUGE
1215	BH	3.25			
1220	BH	4.0			
1225	BH	4.5			
1230	BH	6.0			
1235	BH	7.0			
1240	BH	8.5			
1245	BH	10.25			
1250	BH	12.0			
1252					GAS TO THE SURFACE
1253	.625	5.25	202.2		6" POSITIVE CHOKE (20.25 ABS.
					PSI)
1255	.625	1.0	159.8		6" POSITIVE CHOKE (16.0 ABS PSI)

TYPE & SIZE MEASURING DEVICE : 6" POSITIVE CHOKE | TICKET NO: 70595500

TIME	CHOKE SIZE	SURFACE PRESSURE PSI	GAS RATE MCF	LIQUID RATE BPD	REMARKS
					CHANGED TO 58 DUNCE GAUGE
1300	.625	10 DZ	156.0		{15.625 ABS. PSI}
1302	BH				TURNED BACK TO BUCKET
					CHANGED OUT FLOW LINE CHOKE
					INSTALLED 6" POSITIVE CHOKE -.25"
1305	.25	4.0	28.0		CHANGED TO 15 PSI GAUGE {19.0
					ABS. PSI}
1310	.25	8.0	33.9		{23.0 ABS. PSI}
1315	.25	11.5			{26.5 ABS. PSI}
1317	.25				CLOSED IN FLOW LINE - FLARE GAS
1318	.25				FLOW LINE OPEN
1320	.25	14.0	42.7		{29.0 ABS. PSI}
1320	.25	15.0	44.2		CHANGED OUT GAUGE {30.0 ABS. PSI}
1321	.25	18.0	48.6		30 PSI GAUGE {33.0 ABS. PSI}
1325	.25	21.0	53.0		{36.0 ABS. PSI}
1330	.25	23.5	56.7		{38.5 ABS. PSI}
1335	.25	28.0	63.3		{43.0 ABS. PSI}
1338	.25	30.0	66.3		CHANGED OUT GAUGE {45.0 ABS. PSI}
1339	.25	31.0	67.7		60 PSI GAUGE {46.0 ABS. PSI}
1340	.25	32.5	69.9		{47.5 ABS. PSI}
1345	.25	36.5	75.8		{51.5 ABS. PSI}
1350	.25	41.0	82.5		{56.0 ABS. PSI}
1355	.25	45.5	89.1		{60.5 ABS. PSI}
1356	.25	46.0	89.8		{61.0 ABS. PSI}
					CAUGHT GAS SAMPLE
					CLOSED IN TOOL FOR 2ND CIP
1557					FILLED ANNULUS
1603					OPENED BYPASS
1610					OFF BOTTOM
1615					TRIPPED OUT OF HOLE WITH DST
1900					BROKE DOWN TOOLS
2000					LOADED OUT TOOLS
2100					RELEASED FROM DUTY

TICKET NO : 70595500

GAUGE NO : 7352

CLOCK NO : 17532 HOUR : 24

DEPTH : 5733.0

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B	1	0.0	28.4		
	2	2.0	29.4	0.9	
	3	4.0	31.2	1.9	
	4	6.0	33.9	2.6	
	5	8.0	34.9	1.1	
	6	10.0	34.9	0.0	
	7	12.0	36.5	1.5	
	8	14.0	37.3	0.8	
C	9	15.6	38.0	0.8	
FIRST CLOSED-IN					
C	1	0.0	38.0		
	2	1.0	104.5	66.5	0.9 1.252
	3	2.0	156.6	118.6	1.8 0.963
	4	3.0	195.8	157.8	2.5 0.821
	5	4.0	235.6	197.5	3.2 0.712
	6	5.0	270.2	232.2	3.8 0.639
	7	6.0	302.6	264.6	4.4 0.576
	8	7.0	329.9	291.8	4.9 0.529
	9	8.0	360.7	322.7	5.4 0.487
	10	9.0	384.4	346.4	5.8 0.456
	11	10.0	410.3	372.3	6.2 0.426
	12	12.0	459.9	421.9	7.0 0.379
	13	14.0	504.9	466.9	7.6 0.340
	14	16.0	546.9	508.9	8.2 0.309
	15	18.0	584.2	546.1	8.6 0.285
	16	20.0	618.3	580.3	9.1 0.263
	17	22.0	643.6	605.6	9.5 0.244
	18	24.0	669.5	631.5	9.8 0.228
	19	26.0	691.8	653.7	10.1 0.215
	20	28.0	711.2	673.1	10.4 0.202
	21	30.0	730.9	692.9	10.7 0.192
	22	35.0	775.0	737.0	11.3 0.169
	23	40.0	812.5	774.5	11.7 0.151
	24	45.0	847.9	809.9	12.1 0.137
	25	50.0	883.9	845.8	12.5 0.125
	26	55.0	918.1	880.1	12.8 0.115
D	27	60.6	957.0	919.0	13.1 0.105
SECOND FLOW					
E	1	0.0	29.5		
	2	10.0	44.8	15.3	
	3	20.0	51.6	6.8	
	4	30.0	56.6	4.9	
	5	40.0	62.3	5.7	
	6	50.0	68.2	5.9	
<input type="checkbox"/>	7	57.0	73.6	5.4	

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND FLOW - CONTINUED					
	8	60.0	61.2	-12.4	
	9	70.0	65.5	4.3	
	10	80.0	75.1	9.6	
	11	90.0	84.7	9.6	
	12	100.0	94.5	9.7	
	13	110.0	105.1	10.7	
F	14	120.1	115.0	9.9	
SECOND CLOSED-IN					
F	1	0.0	115.0		
	2	0.5	350.6	235.6	0.5 2.459
	3	1.0	549.1	434.1	1.0 2.146
	4	1.5	745.4	630.3	1.5 1.958
	5	2.0	845.9	730.9	2.0 1.841
	6	2.5	925.7	810.7	2.4 1.750
	7	3.0	987.5	872.5	2.9 1.675
	8	3.5	1026.1	911.1	3.4 1.608
	9	4.0	1061.9	946.9	3.9 1.550
	10	4.5	1079.8	964.8	4.4 1.496
	11	5.0	1090.7	975.7	4.8 1.457
	12	6.0	1106.0	991.0	5.7 1.377
	13	7.0	1113.5	998.4	6.6 1.315
	14	8.0	1118.9	1003.9	7.6 1.256
	15	9.0	1123.4	1008.4	8.5 1.208
	16	10.0	1125.9	1010.9	9.3 1.168
	17	12.0	1130.6	1015.6	11.0 1.093
	18	14.0	1133.9	1018.8	12.7 1.031
	19	16.0	1136.8	1021.8	14.3 0.980
	20	18.0	1139.2	1024.1	15.9 0.934
	21	20.0	1141.5	1026.5	17.4 0.895
	22	22.0	1143.1	1028.0	19.0 0.858
	23	24.0	1144.8	1029.7	20.4 0.826
	24	26.0	1146.0	1031.0	21.8 0.797
	25	28.0	1147.4	1032.4	23.3 0.769
	26	30.0	1148.5	1033.5	24.6 0.745
	27	35.0	1150.4	1035.4	27.9 0.691
	28	40.0	1151.9	1036.9	31.0 0.645
	29	45.0	1153.0	1038.0	33.9 0.606
	30	50.0	1154.0	1038.9	36.6 0.572
	31	55.0	1154.7	1039.7	39.2 0.543
	32	60.0	1155.2	1040.2	41.7 0.516
	33	70.0	1155.8	1040.8	46.3 0.471
	34	80.0	1156.6	1041.6	50.5 0.433
	35	90.0	1157.1	1042.1	54.3 0.401
	36	100.0	1157.1	1042.1	57.8 0.374
	37	110.0	1158.5	1043.5	61.0 0.351
	38	120.0	1158.6	1043.6	63.9 0.330
G	39	126.2	1159.3	1044.2	65.6 0.319

LEGEND :  
 CHOKER CHANGE

REMARKS :


















TICKET NO: 70595500  
 CLOCK NO: 13833 HOUR: 24

GAUGE NO: 7351  
 DEPTH: 5785.7

REF	MINUTES	PRESSURE	AP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B	1	0.0	54.6		
	2	2.0	52.9	-1.7	
	3	4.0	52.9	0.0	
	4	6.0	52.9	0.0	
	5	8.0	55.8	2.9	
	6	10.0	56.4	0.6	
	7	12.0	56.7	0.3	
	8	14.0	57.5	0.8	
C	9	16.6	58.3	0.8	
FIRST CLOSED-IN					
C	1	0.0	58.3		
	2	1.0	117.8	59.5	1.0 1.235
	3	2.0	164.5	106.2	1.8 0.964
	4	3.0	202.9	144.6	2.6 0.813
	5	4.0	239.5	181.2	3.2 0.715
	6	5.0	274.6	216.3	3.8 0.638
	7	6.0	305.4	247.1	4.4 0.575
	8	7.0	338.2	279.9	4.9 0.529
	9	8.0	364.3	306.0	5.4 0.489
	10	9.0	392.8	334.5	5.8 0.455
	11	10.0	422.0	363.8	6.3 0.425
	12	12.0	471.5	413.3	7.0 0.377
	13	14.0	517.7	459.4	7.6 0.340
	14	16.0	557.7	499.4	8.2 0.309
	15	18.0	592.9	534.7	8.6 0.284
	16	20.0	625.3	567.0	9.1 0.262
	17	22.0	653.0	594.8	9.5 0.245
	18	24.0	680.2	621.9	9.8 0.229
	19	26.0	702.6	644.4	10.1 0.215
	20	28.0	724.3	666.1	10.4 0.202
	21	30.0	744.8	686.5	10.7 0.191
	22	35.0	788.8	730.5	11.3 0.169
	23	40.0	828.7	770.4	11.8 0.151
	24	45.0	863.4	805.1	12.1 0.137
	25	50.0	900.6	842.3	12.5 0.125
	26	55.0	935.6	877.3	12.8 0.115
D	27	50.6	972.1	913.8	13.1 0.105
SECOND FLOW					
E	1	0.0	51.3		
	2	10.0	62.1	10.8	
	3	20.0	66.9	4.8	
	4	30.0	70.4	3.5	
	5	40.0	74.6	4.3	
	6	50.0	79.9	5.2	
<input checked="" type="checkbox"/>	7	57.0	84.6	4.8	

REF	MINUTES	PRESSURE	AP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND FLOW - CONTINUED					
	8	60.0	75.7	-8.9	
	9	70.0	74.2	-1.6	
	10	80.0	82.9	8.7	
	11	90.0	92.4	9.5	
	12	100.0	101.8	9.4	
	13	110.0	112.4	10.6	
F	14	120.1	123.0	10.6	
SECOND CLOSED-IN					
F	1	0.0	123.0		
	2	0.5	327.2	204.2	0.5 2.439
	3	1.0	531.6	408.6	1.0 2.127
	4	1.5	701.1	578.0	1.5 1.957
	5	2.0	823.2	700.1	2.0 1.835
	6	2.5	891.7	768.6	2.5 1.745
	7	3.0	970.8	847.7	3.0 1.664
	8	3.5	1019.7	896.7	3.4 1.600
	9	4.0	1055.1	932.0	3.9 1.550
	10	4.5	1077.6	954.6	4.4 1.494
	11	5.0	1093.3	970.2	4.8 1.453
	12	6.0	1110.7	987.7	5.8 1.375
	13	7.0	1119.9	996.8	6.7 1.311
	14	8.0	1125.3	1002.2	7.5 1.259
	15	9.0	1129.3	1006.2	8.4 1.211
	16	10.0	1132.3	1009.3	9.3 1.168
	17	12.0	1137.1	1014.1	11.1 1.092
	18	14.0	1140.5	1017.5	12.7 1.031
	19	16.0	1142.9	1019.9	14.4 0.979
	20	18.0	1145.1	1022.1	15.9 0.933
	21	20.0	1147.5	1024.5	17.4 0.895
	22	22.0	1149.3	1026.3	19.0 0.858
	23	24.0	1151.1	1028.0	20.4 0.825
	24	26.0	1152.5	1029.5	21.8 0.797
	25	28.0	1153.5	1030.4	23.3 0.769
	26	30.0	1154.3	1031.2	24.6 0.745
	27	35.0	1157.0	1033.9	27.9 0.691
	28	40.0	1158.8	1035.7	30.9 0.645
	29	45.0	1159.7	1036.7	33.9 0.606
	30	50.0	1160.7	1037.6	36.6 0.573
	31	55.0	1161.3	1038.3	39.2 0.542
	32	60.0	1162.0	1038.9	41.7 0.516
	33	70.0	1162.9	1039.9	46.3 0.471
	34	80.0	1163.7	1040.7	50.5 0.433
	35	90.0	1164.5	1041.5	54.3 0.401
	36	100.0	1164.5	1041.5	57.8 0.374
	37	110.0	1164.5	1041.5	61.0 0.351
	38	120.0	1164.5	1041.5	63.9 0.330
G	39	126.2	1164.4	1041.3	65.6 0.319

LEGEND:  
 CHOKE CHANGE  
 REMARKS:

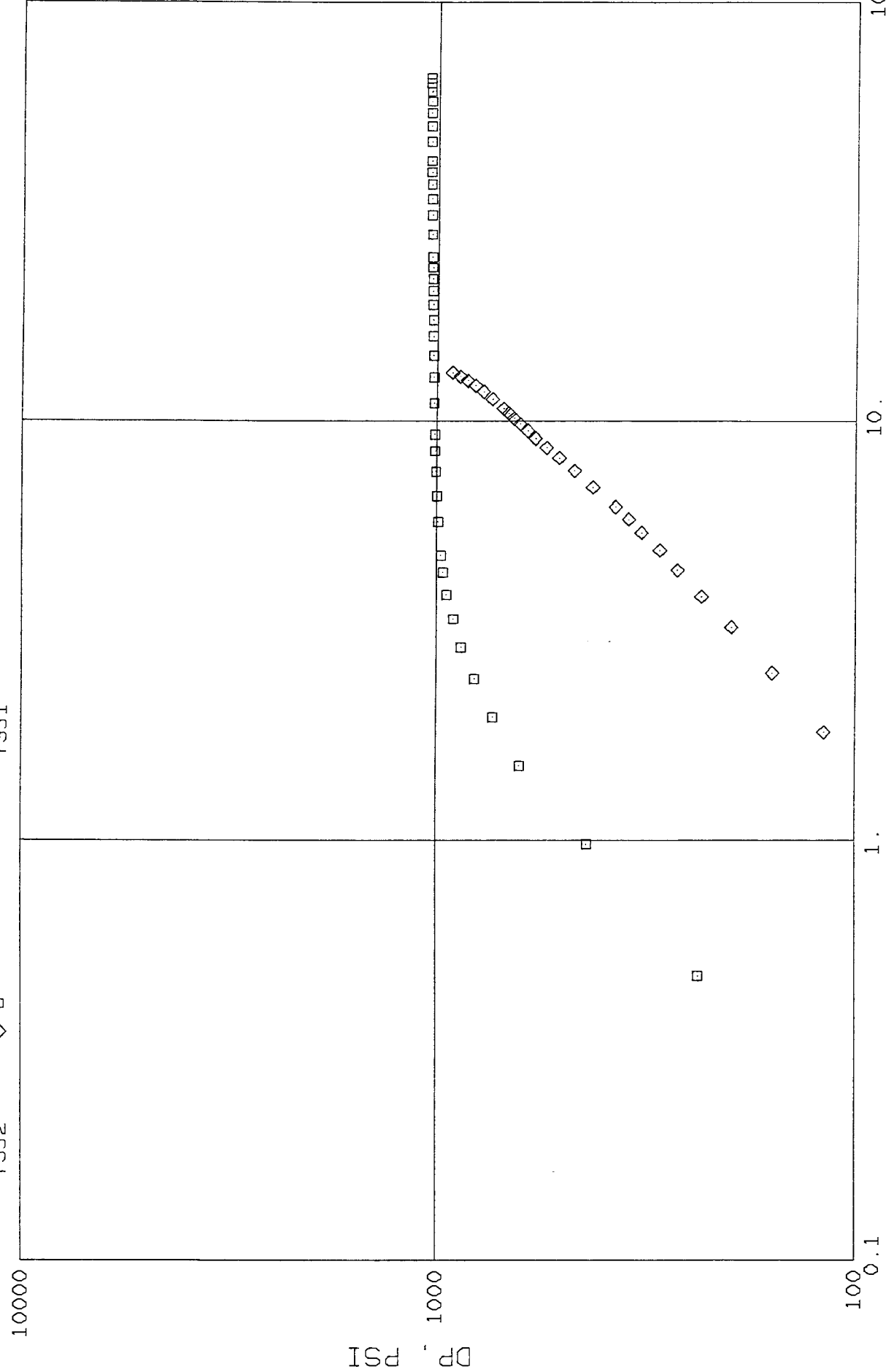
		O.D.	I.D.	LENGTH	DEPTH	
1		DRILL PIPE .....	4.500	3.826	4995.5	
3		DRILL COLLARS .....	6.000	2.250	715.8	
5		CROSSOVER .....	6.000	2.250	1.0	
5		CROSSOVER .....	6.000	2.250	1.0	
50		IMPACT REVERSING SUB .....	6.000	3.000	1.3	5714.0
5		CROSSOVER .....	6.000	2.250	1.0	
11		HANDLING SUB & CHOKE ASSEMBLY ...	4.500	3.500	4.7	
13		DUAL CIP SAMPLER .....	5.000	0.750	6.6	
60		HYDROSPRING TESTER .....	5.000	0.750	5.0	5730.9
80		AP RUNNING CASE .....	5.000	2.250	4.1	5733.0
15		JAR .....	5.000	1.750	5.0	
16		VR SAFETY JOINT .....	5.000	1.000	2.8	
70		OPEN HOLE PACKER .....	6.750	1.530	5.8	5747.8
70		OPEN HOLE PACKER .....	6.750	1.530	5.8	5753.6
20		FLUSH JOINT ANCHOR .....	5.000	2.370	28.0	
83		HT-500 TEMPERATURE CASE .....	5.000		1.5	5784.1
81		BLANKED-OFF RUNNING CASE .....	5.000		4.1	5785.7
		TOTAL DEPTH				5789.0

EQUIPMENT DATA

TICKET NO 70595500

GAUGE NO CIP 1 2  
7351

GAUGE NO CIP 1 2  
7352

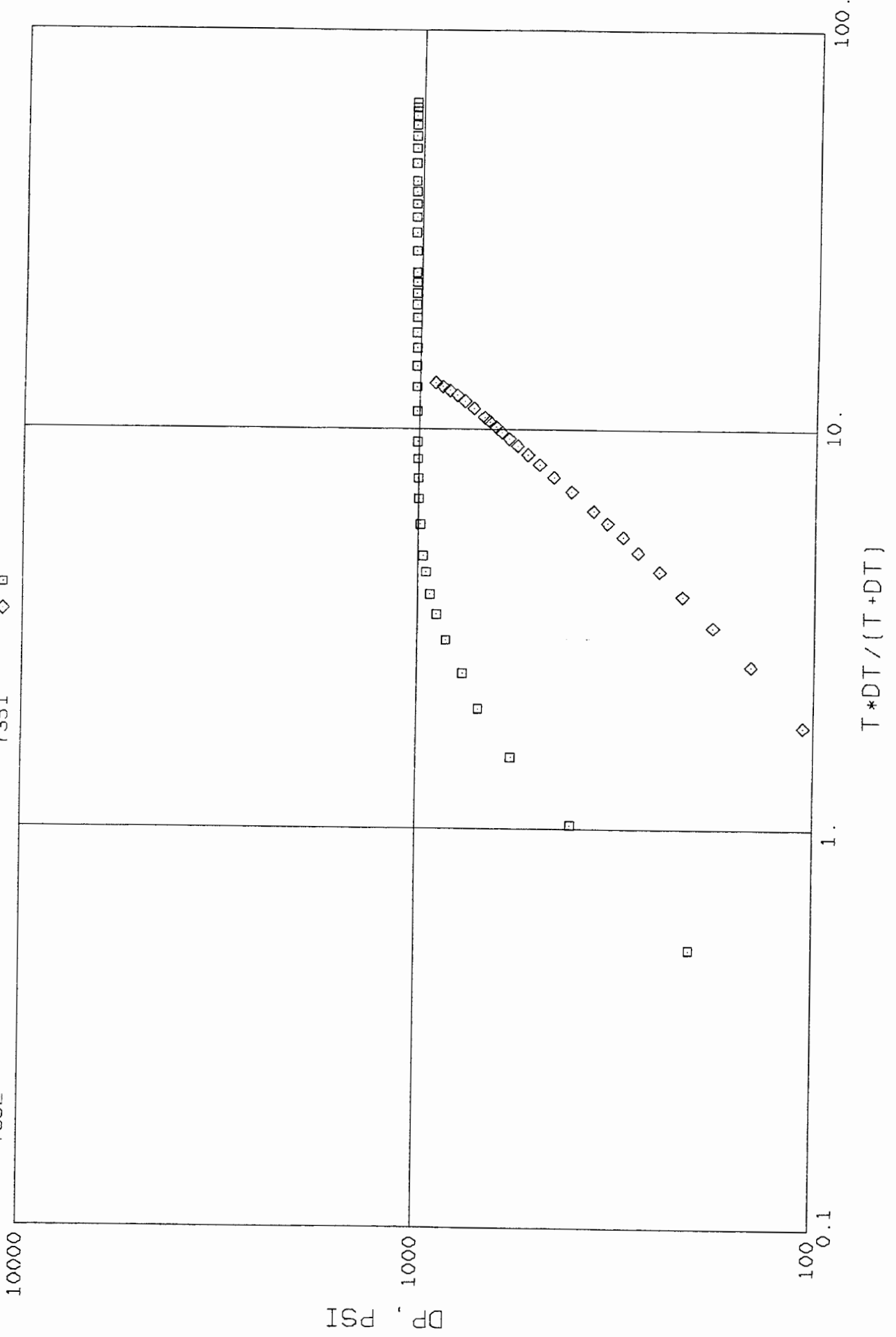


$T*DT/(T+DT)$

TICKET NO 70595500

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7351

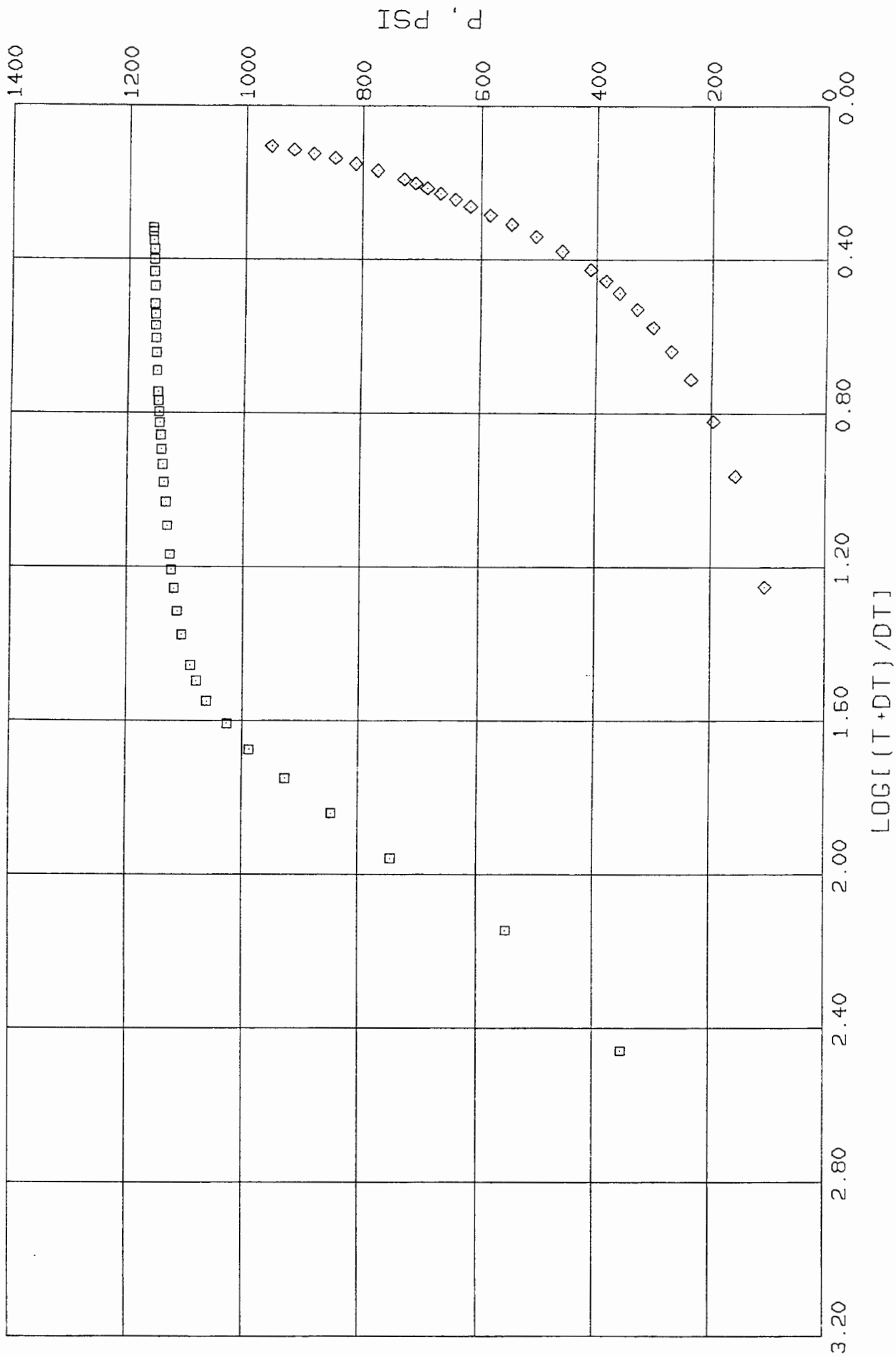
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TICKET NO 70595500

GAUGE NO CIP 1 2  
7351

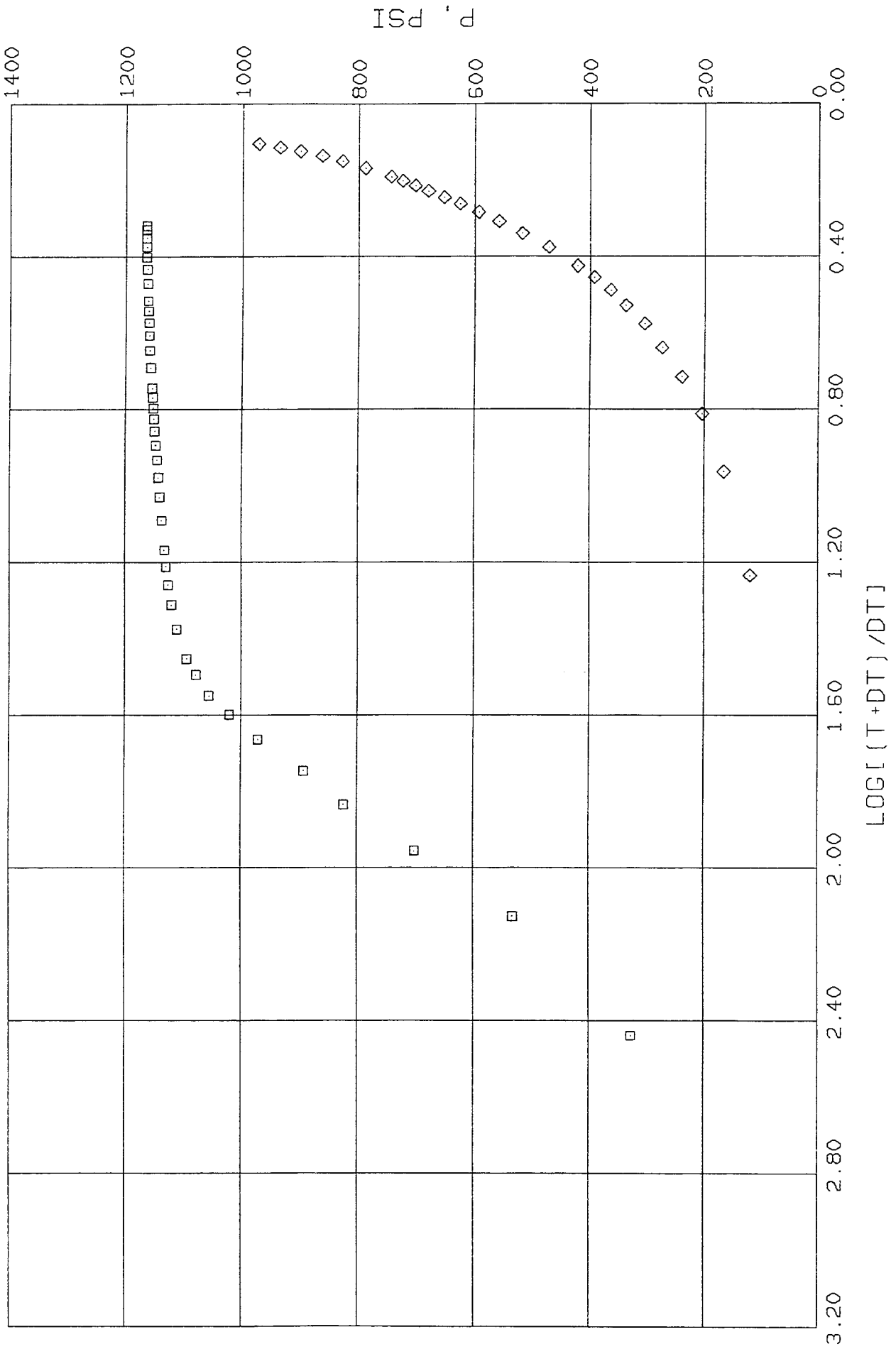
GAUGE NO CIP 1 2  
7352



TICKET NO 70595500

GAUGE NO CIP 1 2  
7351

GAUGE NO CIP 1 2  
7352



# TEMPERATURE RECORDER CHART



10° each circle

Indicated Flow Capacity  $kh = \frac{0.01637 Q_e T}{m}$  md-ft

Average Effective Permeability  $kh = \frac{kh}{h}$  md

Skin Factor  $S = 1.151 \left[ \frac{m(P^*) - m(P)}{m} \text{LOG} \left( \frac{k (1/60)}{\phi \mu c r_w} \right) + 3.23 \right]$

Damage Ratio  $DR = \frac{m(P^*) - m(P)}{m(P^*) - m(P) - 0.87 mS}$

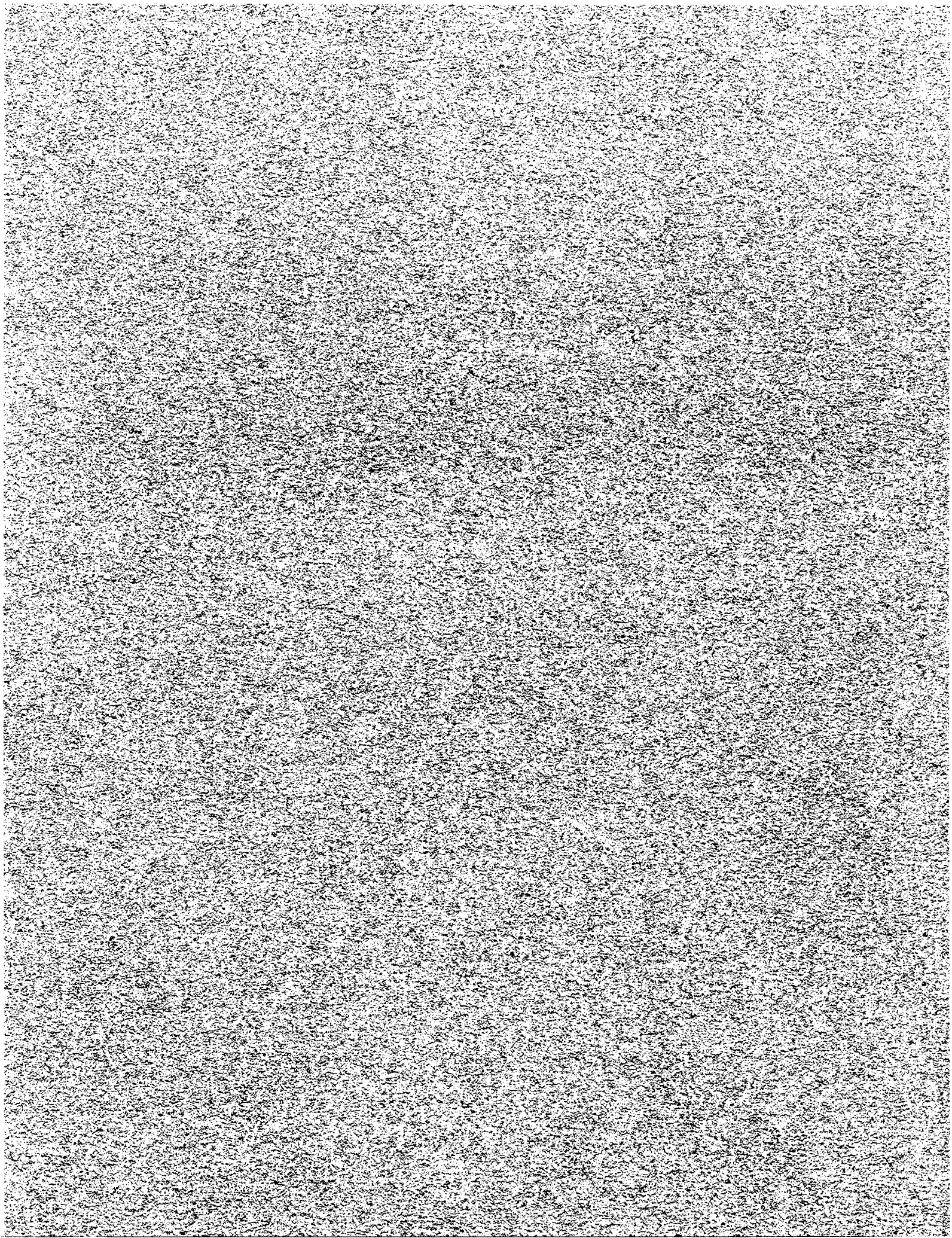
Indicated Flow Rate (Maximum)  $AGF_1 = \frac{Q_e m(P^*)}{m(P^*) - m(P)}$  MCFD

Indicated Flow Rate (Minimum)  $AGF_2 = Q_e \sqrt{\frac{m(P^*)}{m(P^*) - m(P)}}$  MCFD

Approx. Radius of Investigation  $r_i = 0.032 \sqrt{\frac{k (1/60)}{\phi \mu c}}$  ft

Because of the uncertainty of variable well conditions and the necessity of relying on facts and supporting services furnished by others, Halliburton is unable to guarantee the accuracy of any chart interpretation, research analysis, job recommendation or other data furnished by Halliburton. Halliburton personnel will use their best efforts in gathering such information and their best judgment in interpreting it but customer agrees that Halliburton shall not be responsible for any damages arising from the use of such information except where due to Halliburton gross negligence or willful misconduct in the preparation or furnishing of information.





31-31s-39W

KCC

JUL 9 1996

ORIGINAL

Computer inventoried

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MAY 22 1996

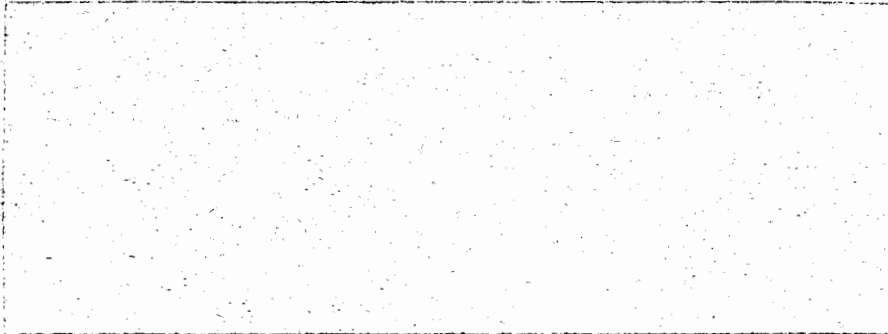
THE UNIVERSITY OF TEXAS AT AUSTIN  
LIBRARY

# DRILL STEM TEST REPORT



# NOMENCLATURE

- B = Formation Volume Factor ..... (Res Vol/Std Vol)
- c<sub>r</sub> = System Total Compressibility ..... (Vol/Vol)/psi
- DR = Damage Ratio
- h = Estimated Net Pay Thickness ..... Ft



- k = Permeability ..... md
- m { = (Liquid) Slope Extrapolated Pressure Plot ..... psi/cycle  
 = (Gas) Slope Extrapolated m(P) Plot ..... MM psi<sup>2</sup>/cp/cycle
- m(P\*) = Real Gas Potential at P\* ..... MM psi<sup>2</sup>/cp
- m(P<sub>i</sub>) = Real Gas Potential at P<sub>i</sub> ..... MM psi<sup>2</sup>/cp
- AOF<sub>1</sub> = Maximum Indicated Absolute Open Flow at Test Conditions ... MCFD
- AOF<sub>2</sub> = Minimum Indicated Absolute Open Flow at Test Conditions .... MCFD
- P\* = Extrapolated Static Pressure ..... Psig
- P<sub>f</sub> = Final Flow Pressure ..... Psig
- Q = Liquid Production Rate During Test ..... BPD
- Q<sub>i</sub> = Theoretical Liquid Production w/Damage Removed ..... BPD
- Q<sub>g</sub> = Measured Gas Production Rate ..... MCFD
- r<sub>i</sub> = Approximate Radius of Investigation ..... Ft
- r<sub>w</sub> = Radius of Well Bore ..... Ft
- S = Skin Factor
- t = Total Flow Time Previous to Closed-in ..... Minutes
- Δt = Closed-in Time at Data Point ..... Minutes
- T = Temperature Rankine ..... °R
- φ = Porosity (fraction)
- μ = Viscosity of Gas or Liquid ..... cp
- Log = Common Log

ORIGINAL

15-129-21355

AMOCO PRODUCTION COMPANY

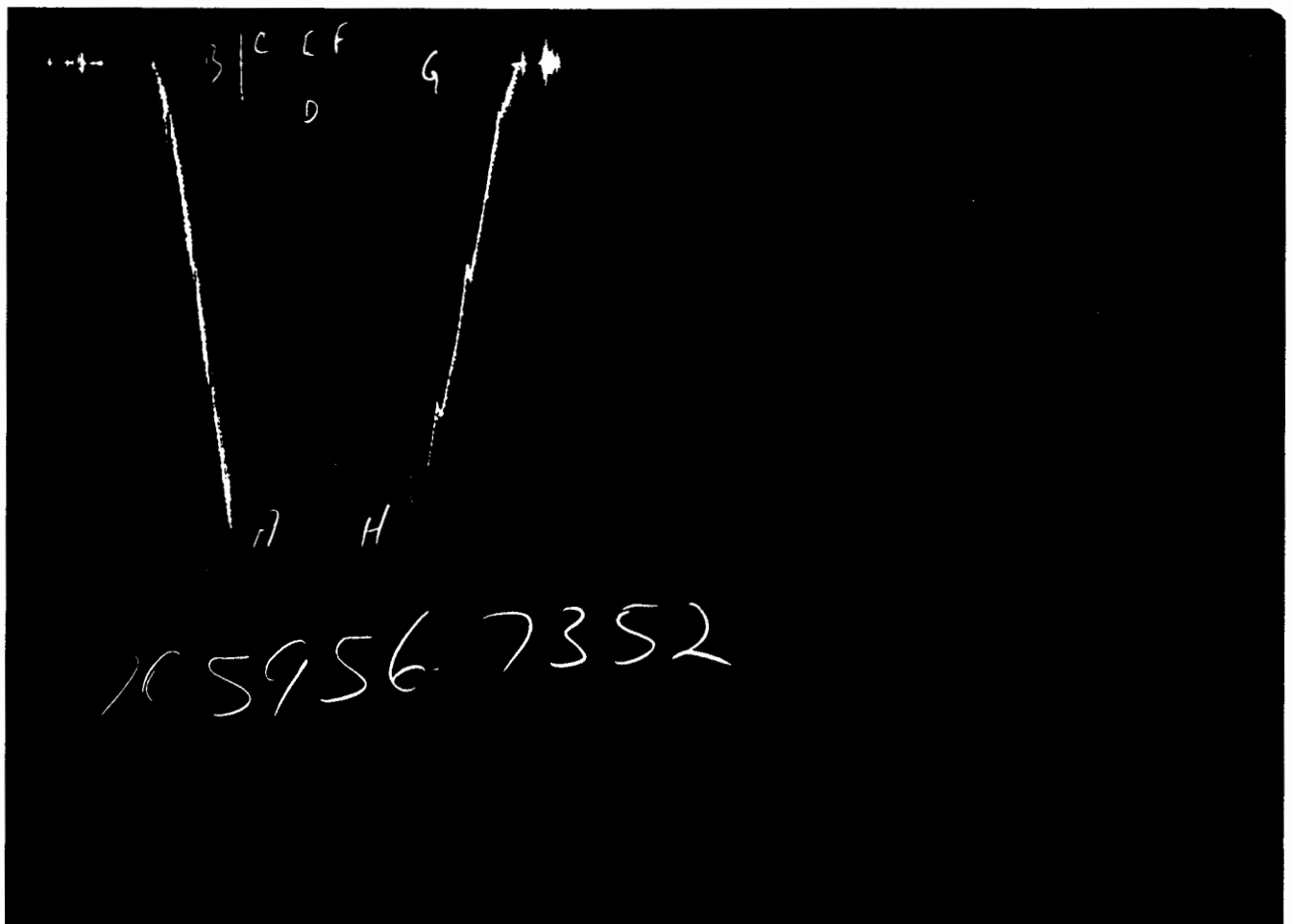
LEASE : MEREDITH JEANNE

WELL NO. : 1-31

TEST NO. : 2

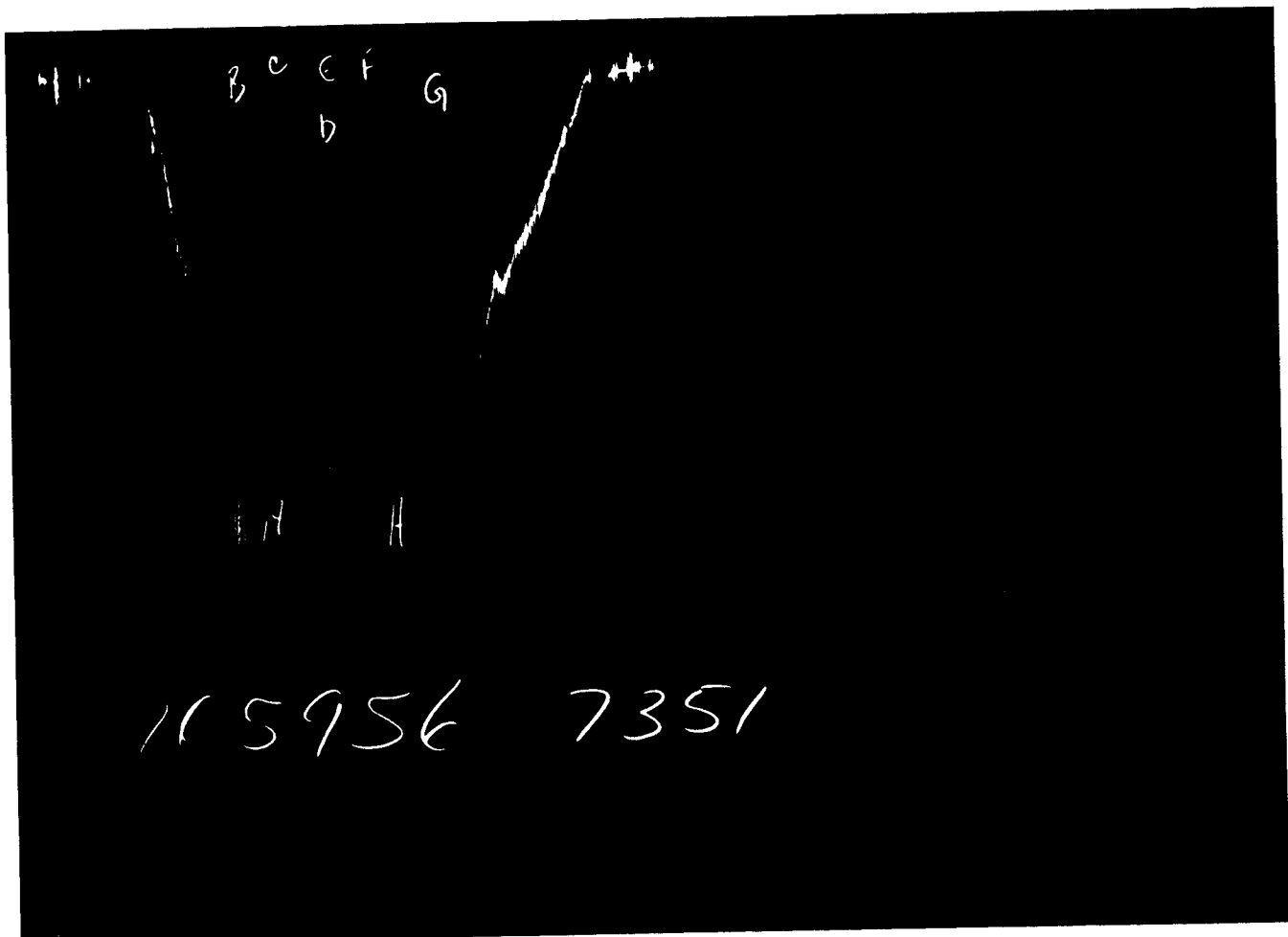
TICKET NO. 70595600  
 27-DEC-94  
 LIBERAL

LEGAL LOCATION SEC. - TWP. - RANG.	31 - 31 S - 39 W	FIELD AREA	ERST KINSLER	COUNTY	MORTON	STATE	KANSAS
LEASE NAME	MEREDITH JEANNE	WELL NO.	1-31	TEST NO.	2	TESTED INTERVAL	5779.8 - 5865.0
LEASE OWNER/COMPANY NAME							AMOCO PRODUCTION COMPANY



GAUGE NO: 7352 DEPTH: 5759.2 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	2771	2774.4			
B	INITIAL FIRST FLOW	13	17.5			
C	FINAL FIRST FLOW	19	19.5	30.0	30.0	F
C	INITIAL FIRST CLOSED-IN	19	19.5			
D	FINAL FIRST CLOSED-IN	127	129.9	60.0	60.0	C
E	INITIAL SECOND FLOW	19	28.2			
F	FINAL SECOND FLOW	22	27.6	31.0	31.0	F
F	INITIAL SECOND CLOSED-IN	22	27.6			
G	FINAL SECOND CLOSED-IN	81	62.2	79.0	79.0	C
H	FINAL HYDROSTATIC	2771	2765.3			



GAUGE NO: 7351 DEPTH: 5861.7 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	2835	2821.3			
B	INITIAL FIRST FLOW	77	63.0			
C	FINAL FIRST FLOW	80	69.5	30.0	30.0	F
C	INITIAL FIRST CLOSED-IN	80	69.5			
D	FINAL FIRST CLOSED-IN	163	173.2	60.0	60.0	C
E	INITIAL SECOND FLOW	77	83.0			
F	FINAL SECOND FLOW	80	76.3	31.0	31.0	F
F	INITIAL SECOND CLOSED-IN	80	76.3			
G	FINAL SECOND CLOSED-IN	109	105.2	79.0	79.0	C
H	FINAL HYDROSTATIC	2835	2807.0			

## EQUIPMENT & HOLE DATA

FORMATION TESTED: KEYES  
 NET PAY (ft): 5.0  
 GROSS TESTED FOOTAGE: 85.2 PACKER TO T.D.  
 ALL DEPTHS MEASURED FROM: KB (11' AGL)  
 CASING PERFS. (ft): \_\_\_\_\_  
 HOLE OR CASING SIZE (in): 7.875  
 ELEVATION (ft): 3272.0 AT KELLY BUSHING  
 TOTAL DEPTH (ft): 5865.0  
 PACKER DEPTH(S) (ft): 5774, 5780  
 FINAL SURFACE CHOKE (in): \_\_\_\_\_  
 BOTTOM HOLE CHOKE (in): 0.750  
 MUD WEIGHT (lb/gal): 9.20 (LSND)  
 MUD VISCOSITY (sec): 54  
 ESTIMATED HOLE TEMP. (°F): \_\_\_\_\_  
 ACTUAL HOLE TEMP. (°F): 130 @ 5860.1 ft

TICKET NUMBER: 70595600

DATE: 12-20-94 TEST NO: 2

TYPE DST: OPEN HOLE

FIELD CAMP:  
LIBERAL

TESTER: JEFF CLARK

WITNESS: SAM CARMACK

DRILLING CONTRACTOR:  
CHEYENNE DRILLING #3

### FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
<u>PIT</u>	<u>0.950 @ 48 °F</u>	<u>3509 ppm</u>
<u>SAMPLER</u>	<u>0.950 @ 48 °F</u>	<u>3509 ppm</u>
<u>RECOVERY</u>	<u>0.950 @ 48 °F</u>	<u>3509 ppm</u>
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm

### SAMPLER DATA

Psig AT SURFACE: \_\_\_\_\_  
 cu.ft. OF GAS: \_\_\_\_\_  
 cc OF OIL: \_\_\_\_\_  
 cc OF WATER: \_\_\_\_\_  
 cc OF MUD: \_\_\_\_\_  
 TOTAL LIQUID cc: \_\_\_\_\_

### HYDROCARBON PROPERTIES

OIL GRAVITY (°API): \_\_\_\_\_ @ \_\_\_\_\_ °F  
 GAS/OIL RATIO (cu.ft. per bbl): \_\_\_\_\_  
 GAS GRAVITY: \_\_\_\_\_

### CUSHION DATA

TYPE	AMOUNT	WEIGHT
_____	_____	_____
_____	_____	_____






















### RECOVERED :

20 FEET OF DRILLING MUD

MEASURED FROM  
TESTER VALVE

### REMARKS :

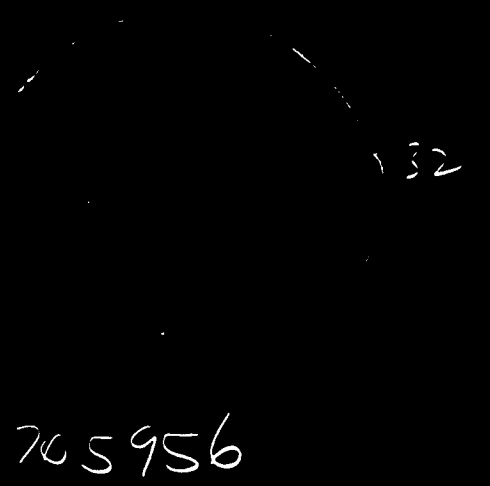


		O.D.	I.D.	LENGTH	DEPTH	
1		DRILL PIPE.....	4.500	3.825	5084.9	
3		DRILL COLLARS.....	6.000	2.250	595.3	
50		IMPACT REVERSING SUB.....	6.000	3.000	1.3	5680.8
3		DRILL COLLARS.....	6.000	2.250	59.3	
5		CROSSOVER.....	6.000	2.250	1.0	
11		HANDLING SUB & CHOKE ASSEMBLY...	4.500	3.500	4.7	
13		DUAL CIP SAMPLER.....	5.000	0.750	6.6	
60		HYDRSPRING TESTER.....	5.000	0.750	5.0	5757.1
80		AP RUNNING CASE.....	5.000	2.250	4.1	5859.2
15		JAR.....	5.000	1.750	5.0	
16		VR SAFETY JOINT.....	5.000	1.000	2.8	
70		OPEN HOLE PACKER.....	6.750	1.530	5.8	5774.0
70		OPEN HOLE PACKER.....	6.750	1.530	5.8	5779.8
20		FLUSH JOINT ANCHOR.....	5.000	2.370	11.0	
5		CROSSOVER.....	6.000	2.250	1.0	
3		DRILL COLLARS.....	6.000	2.250	60.8	
5		CROSSOVER.....	6.000	2.250	1.0	
5		CROSSOVER.....	6.000	2.250	1.0	
20		FLUSH JOINT ANCHOR.....	5.000	2.370	3.0	
83		HT-500 TEMPERATURE CASE.....	5.000		1.5	5860.1
81		BLANKED-OFF RUNNING CASE.....	5.000		4.1	5861.7
TOTAL DEPTH						5865.0

EQUIPMENT DATA

# EQUATIONS FOR DST LIQUID WELL ANALYSIS

## TEMPERATURE RECORDER CHART



10° each circle

Indicated Flow Capacity  $Q_i = \frac{0.00107 G_p}{m}$  MCFD

Average Effective Permeability  $kh = \frac{kh}{h}$  md

Skin Factor  $S = 1.151 \left[ \frac{m(P^*) - m(P_r)}{m} \text{LOG} \left( \frac{k (1/60)}{\phi \mu c_g} \right) + 3.23 \right]$

Damage Ratio  $DR = \frac{m(P^*) - m(P_r)}{m(P^*) - m(P_r) - 0.87 mS}$

Indicated Flow Rate (Maximum)  $AOF = \frac{Q_i m(P^*)}{m(P^*) - m(P_r)}$  MCFD

Indicated Flow Rate (Minimum)  $AOF = Q_i \sqrt{\frac{m(P^*)}{m(P^*) - m(P_r)}}$  MCFD

Approx. Radius of Investigation  $r = 0.032 \sqrt{\frac{k (1/60)}{\phi \mu c_g}}$  ft

Because of the uncertainty of variable well conditions and the necessity of relying on facts and supporting services furnished by others, Halliburton is unable to guarantee the accuracy of any chart interpretation, research analysis, job recommendation or other data furnished by Halliburton. Halliburton personnel will use their best efforts in gathering such information and their best judgment in interpreting it but customer agrees that Halliburton shall not be responsible for any damages arising from the use of such information except where due to Halliburton gross negligence or willful misconduct in the preparation of, or furnishing of, information.

