

892



TICKET NO. 47074800

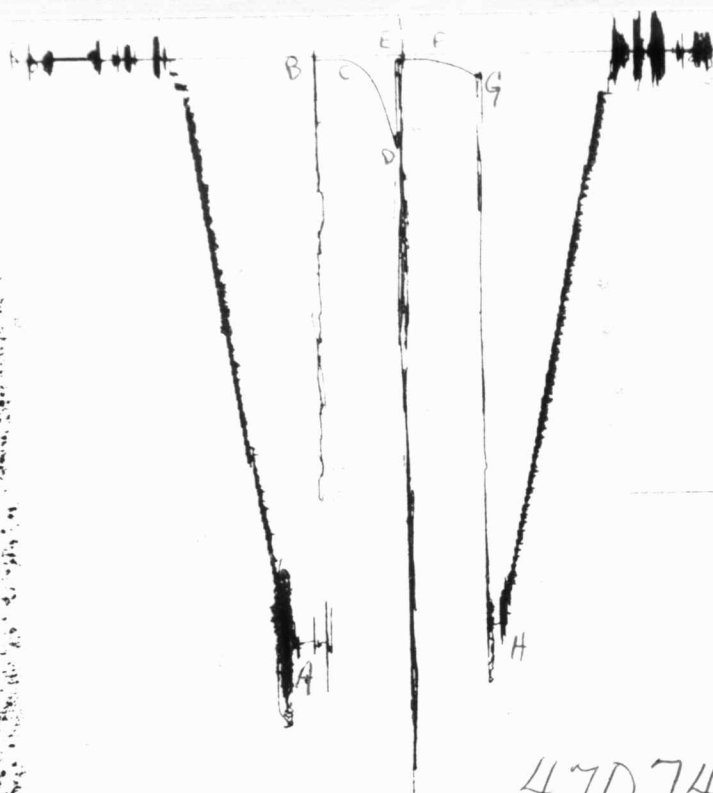
16-JUN-83

PRATT

FORMATION TESTING SERVICE REPORT

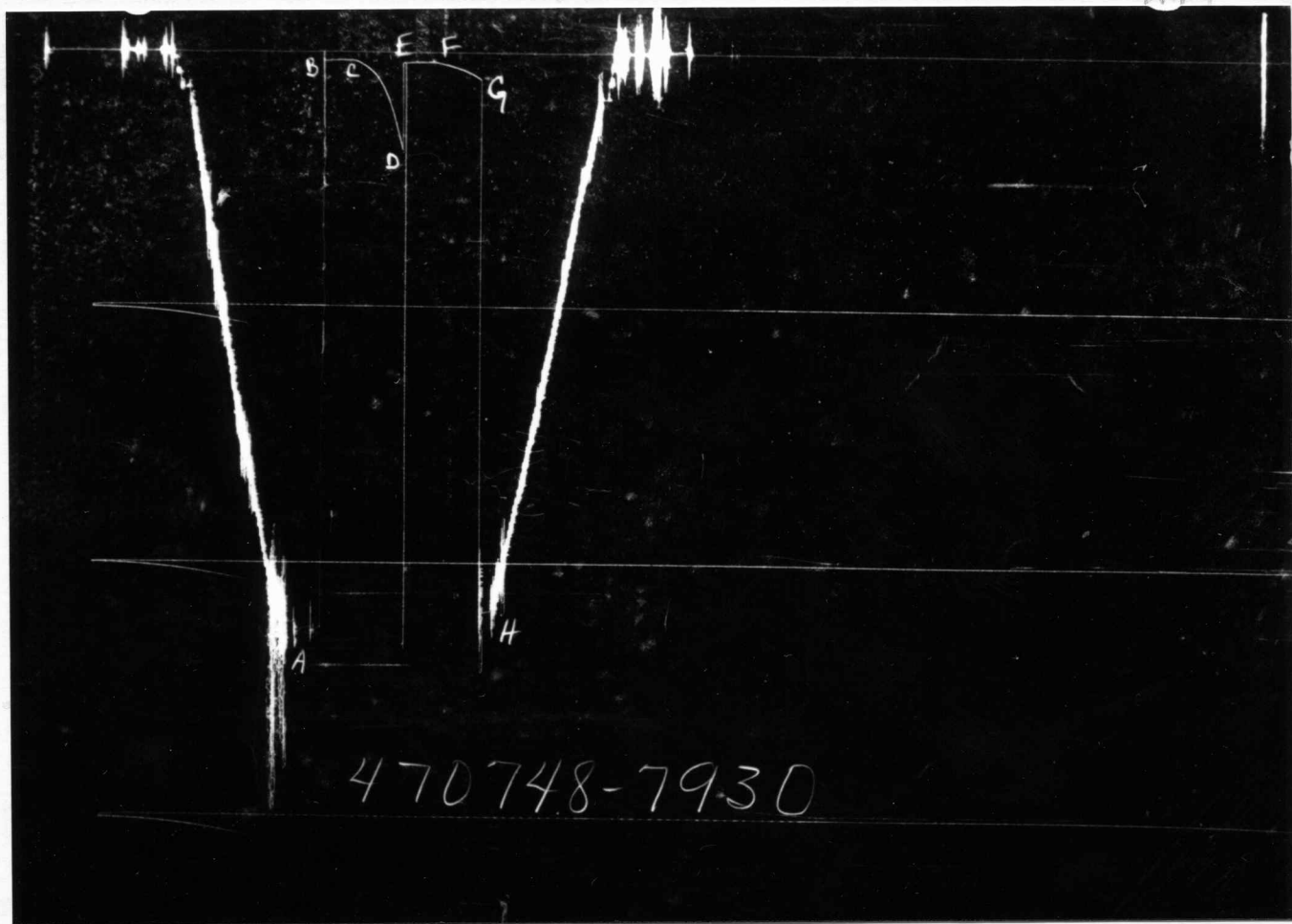
LEGAL LOCATION SEC. - TWP. - RNG.	WELL NO.	TEST NO.	TESTED INTERVAL	COUNTY	PRATT	STATE	KANSAS	BC/IC
10-29-14								

291



GAUGE NO: 7931 DEPTH: 4329.0 BLANKED OFF: NO HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC		2231.3			
B	INITIAL FIRST FLOW		14.6	15.0	15.0	F
C	FINAL FIRST FLOW		14.6			
C	INITIAL FIRST CLOSED-IN		14.6	30.0	30.0	C
D	FINAL FIRST CLOSED-IN		362.1			
E	INITIAL SECOND FLOW		28.0	15.0	15.0	F
F	FINAL SECOND FLOW		19.0			
F	INITIAL SECOND CLOSED-IN		19.0	30.0	30.0	C
G	FINAL SECOND CLOSED-IN		88.6			
H	FINAL HYDROSTATIC		2172.2			



GAUGE NO: 7930 DEPTH: 4372.0 BLANKED OFF: YES HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	2202	2249.5			
B	INITIAL FIRST FLOW	20	36.0			
C	FINAL FIRST FLOW	20	34.9	15.0	15.0	F
C	INITIAL FIRST CLOSED-IN	20	34.9			
D	FINAL FIRST CLOSED-IN	379	383.7	30.0	30.0	C
E	INITIAL SECOND FLOW	30	44.7			
F	FINAL SECOND FLOW	30	40.0	15.0	15.0	F
F	INITIAL SECOND CLOSED-IN	30	40.0			
G	FINAL SECOND CLOSED-IN	100	107.4	30.0	30.0	C
H	FINAL HYDROSTATIC	2162	2189.0			

777

EQUIPMENT & HOLE DATA

FORMATION TESTED: KANSAS CITY
 NET PAY (ft): _____
 GROSS TESTED FOOTAGE: 30.0
 ALL DEPTHS MEASURED FROM: KELLY BUSHING
 CASING PERFS. (ft): _____
 HOLE OR CASING SIZE (in): 7.875
 ELEVATION (ft): 2016
 TOTAL DEPTH (ft): 4375.0
 PACKER DEPTH(S) (ft): 4339, 4345
 FINAL SURFACE CHOKE (in): 1.000
 BOTTOM HOLE CHOKE (in): 0.750
 MUD WEIGHT (lb/gal): 9.60
 MUD VISCOSITY (sec): 38
 ESTIMATED HOLE TEMP. (°F): _____
 ACTUAL HOLE TEMP. (°F): 108 @ 4370.0 ft

TICKET NUMBER: 47074800

DATE: 6-13-83 TEST NO: 1

TYPE DST: OPEN HOLE

HALLIBURTON CAMP:
PRATT

TESTER: L. R. PARKER

WITNESS: P. HAGEMEIERS

DRILLING CONTRACTOR:
WHITE & ELLIS DRILLING COMPANY

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm

SAMPLER DATA

Pstg 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:

10 FEET OF DRILLING MUD

MEASURED FROM
TESTER VALVE

REMARKS:

[illegible]

877

TICKET NO. 47074800

		O.D.	I.D.	LENGTH	DEPTH	
1		DRILL PIPE.....	4.500	3.826	3977.0	
3		DRILL COLLARS.....	6.000	2.250	213.0	
50		IMPACT REVERSING SUB.....	6.000	2.750	1.0	4190.0
3		DRILL COLLARS.....	6.000	2.250	121.0	
5		CROSSOVER.....	6.000	2.250	1.0	
11		HANDLING SUB & CHOKE ASSEMBLY...	5.750	3.750	5.0	
12		DUAL CIP VALVE.....	5.000	0.870	5.0	
60		HYDROSPRING TESTER.....	5.000	0.750	5.0	4327.0
80		AP RUNNING CASE.....	5.000	3.060	4.0	4329.0
16		VR SAFETY JOINT.....	5.000	1.000	3.0	
70		OPEN HOLE PACKER.....	6.750	1.530	6.0	4339.0
70		OPEN HOLE PACKER.....	6.750	1.530	6.0	4345.0
20		FLUSH JOINT ANCHOR.....	5.000	2.370	23.0	
83		HT-500 TEMPERATURE CASE.....	5.000		1.0	4370.0
81		BLANKED-OFF RUNNING CASE.....	5.000		4.0	4372.0
TOTAL DEPTH					4375.0	

EQUIPMENT DATA

TEMPERATURE

RECORDER

CHART



10° each circle

Indicated Flow
Capacity

$$kh = \frac{1637 Q_g T}{m}$$

md-ft

Average Effective
Permeability

$$k = \frac{kh}{h}$$

md

Skin Factor

$$S = 1.151 \left[\frac{m(P^*) - m(P_f)}{m} - \text{LOG} \frac{kt}{\phi \mu c_{f_w} r_w^2} + 3.23 \right] \text{ ---}$$

Damage Ratio

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

Indicated Flow
Rate (Maximum)

$$AOF_1 = \frac{Q_g m(P^*)}{m(P^*) - m(P_f)}$$

MCFD

Indicated Flow
Rate (Minimum)

$$AOF_2 = Q_g \sqrt{\frac{m(P^*)}{m(P^*) - m(P_f)}}$$

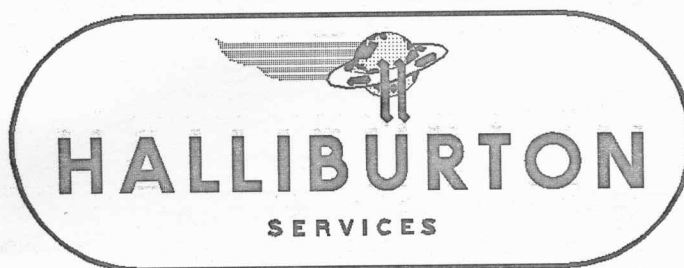
MCFD

Approx. Radius of
Investigation

$$r_i = 0.032 \sqrt{\frac{kt}{\phi \mu c_i}}$$

ft

182



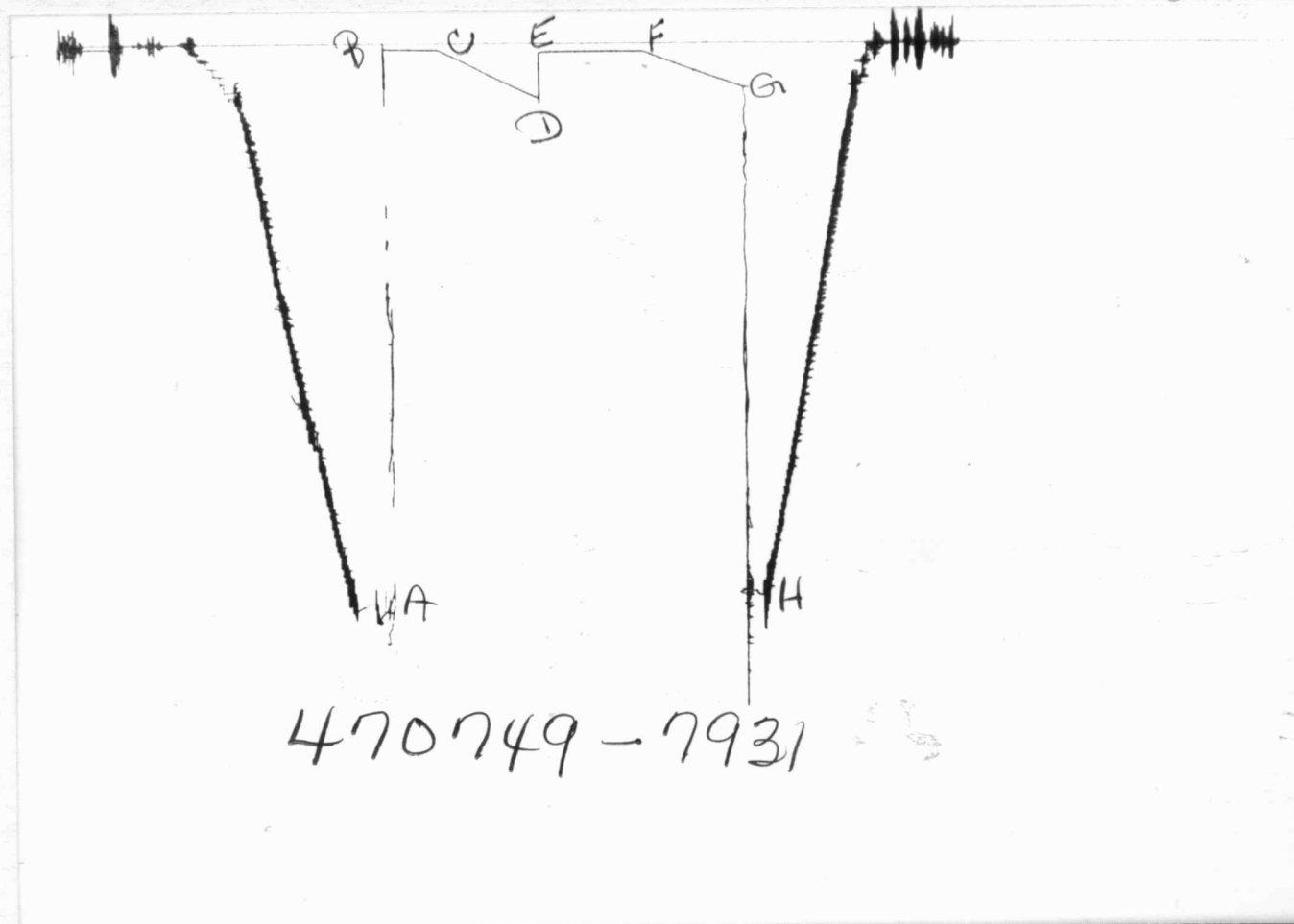
TICKET NO. 47074900

17-JUN-83

PRATT

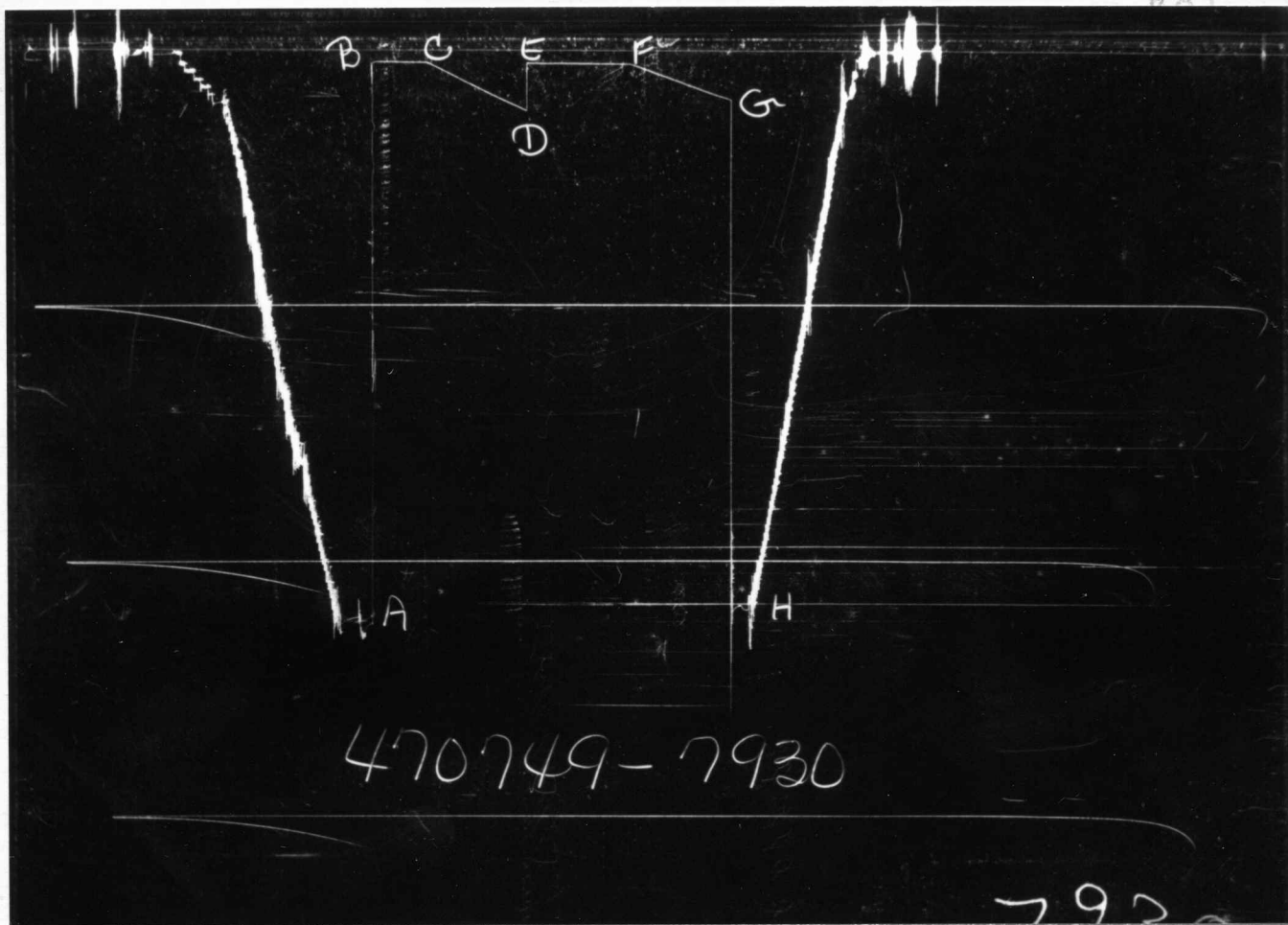
FORMATION TESTING SERVICE REPORT

KERR ESTATE		2	2	4400	4400	LEASE OWNER/COMPANY NAME
LEASE NAME		WELL NO.	TEST NO.	TESTED INTERVAL		
LEGAL LOCATION SEC. - TWP. - RNG.	10 29 14		FIELD AREA	COUNTY	PRATT	STATE KANSAS BJ SM



GAUGE NO: 7931 DEPTH: 4414.0 BLANKED OFF: NO HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC		2201.8			
B	INITIAL FIRST FLOW		20.7			
C	FINAL FIRST FLOW		26.0	30.0	30.0	F
C	INITIAL FIRST CLOSED-IN		26.0			
D	FINAL FIRST CLOSED-IN		209.2	60.0	60.0	C
E	INITIAL SECOND FLOW		33.3			
F	FINAL SECOND FLOW		33.3	60.0	60.0	F
F	INITIAL SECOND CLOSED-IN		33.3			
G	FINAL SECOND CLOSED-IN		170.4	60.0	60.0	C
H	FINAL HYDROSTATIC		2157.9			



GAUGE NO: 7930 DEPTH: 4457.0 BLANKED OFF: YES HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	2192	2225.6			
B	INITIAL FIRST FLOW	40	47.4	30.0	30.0	F
C	FINAL FIRST FLOW	40	49.4			
C	INITIAL FIRST CLOSED-IN	40	49.4	60.0	60.0	C
D	FINAL FIRST CLOSED-IN	230	237.3			
E	INITIAL SECOND FLOW	40	51.2	60.0	60.0	F
F	FINAL SECOND FLOW	40	54.4			
F	INITIAL SECOND CLOSED-IN	40	54.4	60.0	60.0	C
G	FINAL SECOND CLOSED-IN	190	193.6			
H	FINAL HYDROSTATIC	2182	2178.8			

EQUIPMENT & HOLE DATA

FORMATION TESTED: MARMATON

NET PAY (ft): 21.0

GROSS TESTED FOOTAGE: 30.0

ALL DEPTHS MEASURED FROM: _____

CASING PERFS. (ft): _____

HOLE OR CASING SIZE (in): 7.875

ELEVATION (ft): 2016

TOTAL DEPTH (ft): 4460.0

PACKER DEPTH(S) (ft): 4424, 4430

FINAL SURFACE CHOKE (in): 1.000

BOTTOM HOLE CHOKE (in): 0.750

MUD WEIGHT (lb/gal): 9.60

MUD VISCOSITY (sec): 42

ESTIMATED HOLE TEMP. (°F): _____

ACTUAL HOLE TEMP. (°F): 107 @ 4455.0 ft

TICKET NUMBER: 47074900DATE: 6-14-83 TEST NO: 2TYPE DST: OPEN HOLEHALLIBURTON CAMP:
PRATTTESTER: L.R. PARKERWITNESS: P. HAGEMEIERSDRILLING CONTRACTOR:
WHITE AND ELLIS DRILLING COMPANYFLUID PROPERTIES FOR
RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm

SAMPLER DATA

Pstg 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:

30 FEET OF DRILLING MUD WITH FEW SPECKS OF OIL

MEASURED FROM
TESTER VALVE

REMARKS:

98

[illegible]

281

TICKET NO. 47074900

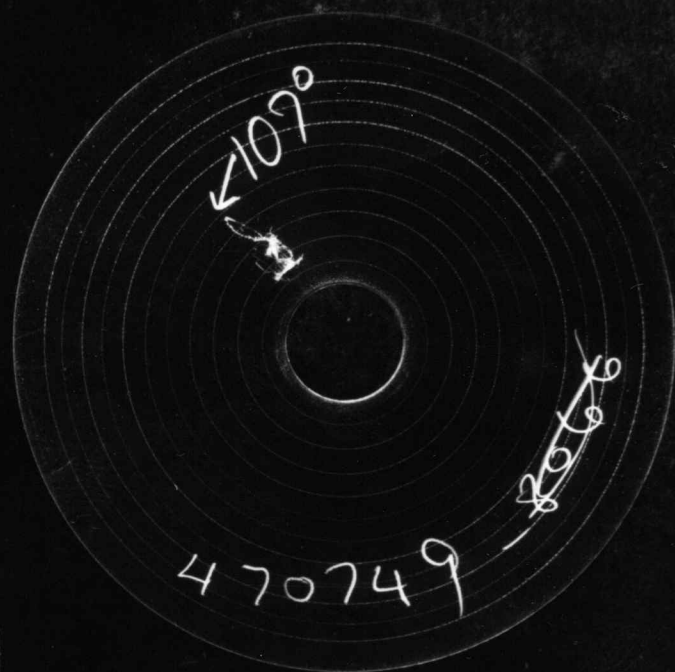
		O.D.	I.D.	LENGTH	DEPTH	
1		DRILL PIPE.....	4.500	3.826	4062.0	
3		DRILL COLLARS.....	6.000	2.250	213.0	
50		IMPACT REVERSING SUB.....	6.000	2.750	1.0	4275.0
3		DRILL COLLARS.....	6.000	2.250	121.0	
5		CROSSOVER.....	6.000	2.250	1.0	
11		HANDLING SUB & CHOKE ASSEMBLY...	5.750	3.750	5.0	
12		DUAL CIP VALVE.....	5.000	0.870	5.0	
60		HYDROSPRING TESTER.....	5.000	0.750	5.0	4412.0
80		AP RUNNING CASE.....	5.000	3.060	4.0	4414.0
16		VR SAFETY JOINT.....	5.000	1.000	3.0	
70		OPEN HOLE PACKER.....	6.750	1.530	6.0	4424.0
70		OPEN HOLE PACKER.....	6.750	1.530	6.0	4430.0
20		FLUSH JOINT ANCHOR.....	5.000	2.370	23.0	
83		HT-500 TEMPERATURE CASE.....	5.000		1.0	4455.0
81		BLANKED-OFF RUNNING CASE.....	5.000		4.0	4457.0
TOTAL DEPTH					4460.0	

EQUIPMENT DATA

TEMPERATURE

RECORDER

CHART



10° each circle

Capacity

$$kh = \frac{\text{md-ft}}{m}$$

md-ft

Average Effective
Permeability

$$k = \frac{kh}{h}$$

md

Skin Factor

$$S = 1.151 \left[\frac{m(P^*) - m(P_f)}{m} - \text{LOG} \frac{kt}{\phi \mu c_t r_w^2} + 3.23 \right] \text{ ---}$$

Damage Ratio

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

Indicated Flow
Rate (Maximum)

$$AOF_1 = \frac{Q_g m(P^*)}{m(P^*) - m(P_f)} \text{ MCFD}$$

Indicated Flow
Rate (Minimum)

$$AOF_2 = Q_g \sqrt{\frac{m(P^*)}{m(P^*) - m(P_f)}} \text{ MCFD}$$

Approx. Radius of
Investigation

$$r_i = 0.032 \sqrt{\frac{kt}{\phi \mu c_t}} \text{ ft}$$

352



TICKET NO. 47075000

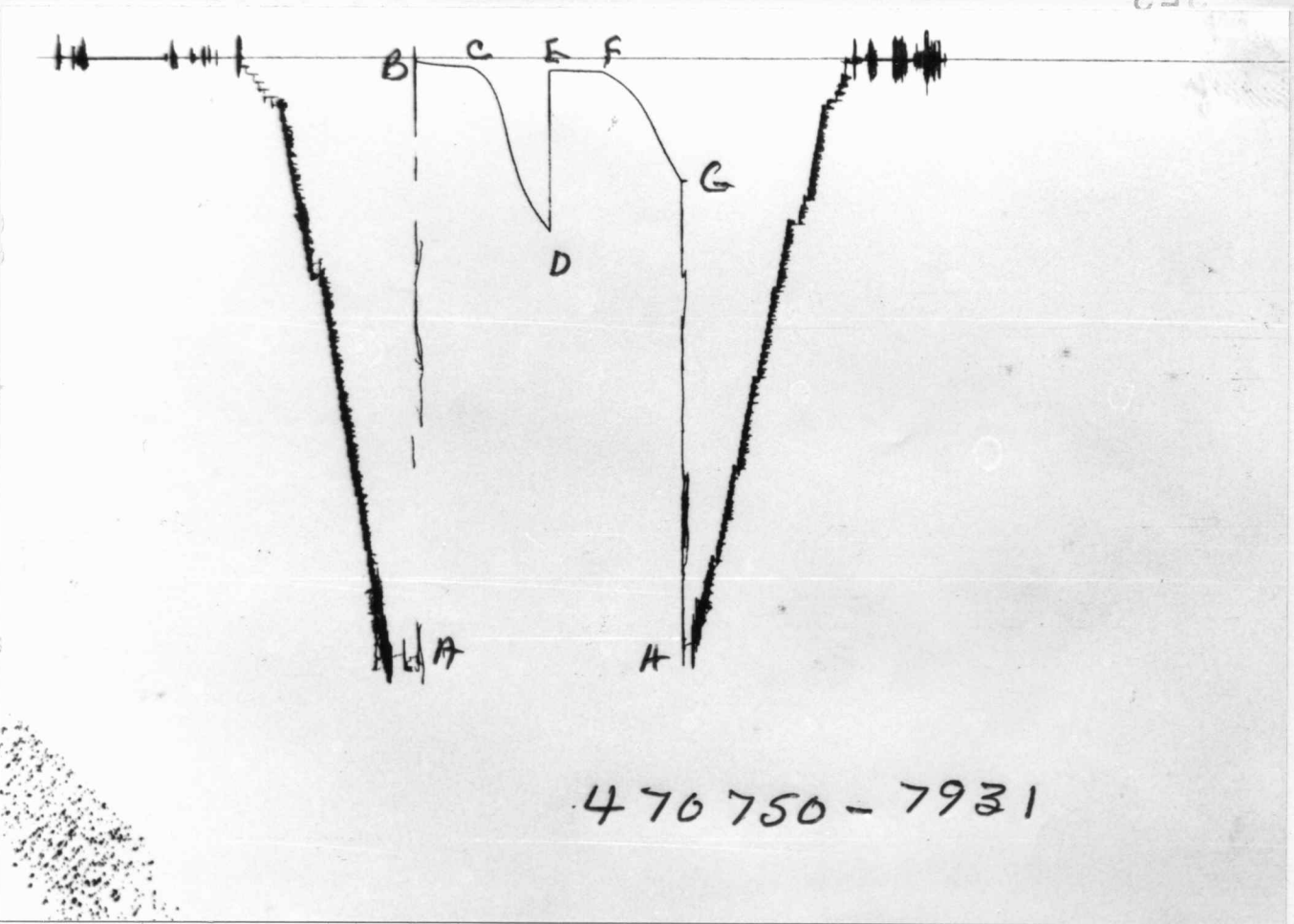
20-JUN-83

PRATT

FORMATION TESTING SERVICE REPORT

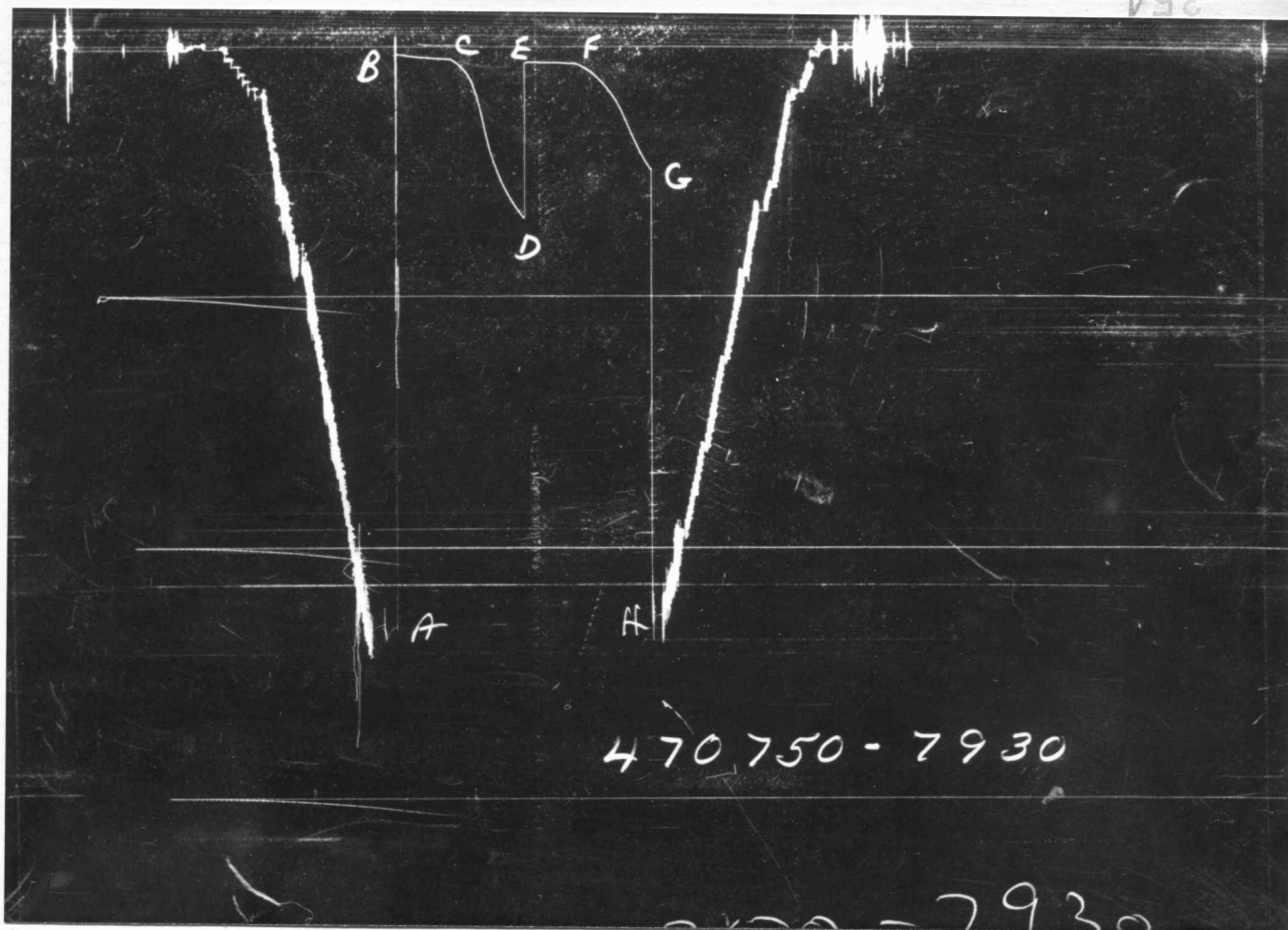
LEASE NAME	WELL NO.	TEST NO.	TESTED INTERVAL	LEASE OWNER/COMPANY NAME
LEGAL LOCATION SEC. - TWP. - RNG.	10-29-14	FIELD AREA	COUNTY	PRATT
			STATE	KANSAS
				DR

858



GAUGE NO: 7931 DEPTH: 4550.0 BLANKED OFF: NO HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC		2288.7			
B	INITIAL FIRST FLOW		13.8			
C	FINAL FIRST FLOW		36.1	30.0	31.9	F
C	INITIAL FIRST CLOSED-IN		36.1			
D	FINAL FIRST CLOSED-IN		664.5	45.0	43.4	C
E	INITIAL SECOND FLOW		52.3			
F	FINAL SECOND FLOW		52.3	30.0	30.3	F
F	INITIAL SECOND CLOSED-IN		52.3			
G	FINAL SECOND CLOSED-IN		476.2	45.0	44.4	C
H	FINAL HYDROSTATIC		2250.5			



GAUGE NO: 7930 DEPTH: 4589.0 BLANKED OFF: YES HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	2301	2302.4			
B	INITIAL FIRST FLOW	20	32.5			
C	FINAL FIRST FLOW	40	52.1	30.0	31.9	F
C	INITIAL FIRST CLOSED-IN	40	52.1			
D	FINAL FIRST CLOSED-IN	687	687.6	45.0	43.4	C
E	INITIAL SECOND FLOW	50	67.1			
F	FINAL SECOND FLOW	50	69.0	30.0	30.3	F
F	INITIAL SECOND CLOSED-IN	50	69.0			
G	FINAL SECOND CLOSED-IN	499	494.7	45.0	44.4	C
H	FINAL HYDROSTATIC	2261	2263.7			

EQUIPMENT & HOLE DATA

FORMATION TESTED: SIMPSON
 NET PAY (ft): 4.0
 GROSS TESTED FOOTAGE: 26.0
 ALL DEPTHS MEASURED FROM: KELLY BUSHING
 CASING PERFS. (ft): _____
 HOLE OR CASING SIZE (in): 7.875
 ELEVATION (ft): 2016
 TOTAL DEPTH (ft): 4592.0
 PACKER DEPTH(S) (ft): 4560, 4566
 FINAL SURFACE CHOKE (in): 1.000
 BOTTOM HOLE CHOKE (in): 0.750
 MUD WEIGHT (lb/gal): 9.30
 MUD VISCOSITY (sec): 41
 ESTIMATED HOLE TEMP. (°F): _____
 ACTUAL HOLE TEMP. (°F): 115 @ 4587.0 ft

TICKET NUMBER: 47075000

DATE: 6-15-83 TEST NO: 3

TYPE DST: OPEN HOLE

HALLIBURTON CAMP:
PRATT

TESTER: L.R. PARKER

WITNESS: P. HAGEMGIER

DRILLING CONTRACTOR:
WHITE AND ELLIS DRILLING COMPANY

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm

SAMPLER DATA

Pstg 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:

65' OF SLIGHTLY OIL CUT MUD WITH A SMALL AMOUNT OF
 GAS ON TOP OF FLUID.

MEASURED FROM
 TESTER VALVE

REMARKS:

GRIND OUT: TOP RECOVERY 10% OIL, 10% WATER, 80% MUD
 BOTTOM RECOVERY 5% OIL, 15% WATER, 80% MUD.
 CHLORIDES ON BOTH 28,900 PPM

[illegible]

298

TICKET NO: 47075000

CLOCK NO: 26864 HOUR: 12



GAUGE NO: 7931

DEPTH: 4550.0

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	13.8			
2	3.0	17.8	3.9		
3	6.0	22.3	4.5		
4	9.0	24.8	2.5		
5	12.0	27.1	2.2		
6	15.0	28.7	1.6		
7	18.0	30.5	1.8		
8	21.0	31.7	1.2		
9	24.0	33.1	1.4		
10	27.0	33.1	0.0		
11	30.0	35.1	1.9		
C 12	31.9	36.1	1.0		
FIRST CLOSED-IN					
C 1	0.0	36.1			
2	1.0	38.3	2.2	1.0	1.517
3	2.0	41.3	5.3	1.8	1.238
4	3.0	45.8	9.7	2.8	1.062
5	4.0	49.9	13.8	3.6	0.949
6	5.0	55.4	19.3	4.4	0.865
7	6.0	61.6	25.6	5.1	0.799
8	7.0	67.1	31.0	5.7	0.747
9	8.0	74.1	38.1	6.4	0.696
10	9.0	81.8	45.8	7.0	0.656
11	10.0	91.4	55.4	7.6	0.622
12	12.0	113.0	77.0	8.7	0.563
13	14.0	143.6	107.6	9.7	0.515
14	16.0	183.6	147.6	10.7	0.476
15	18.0	236.1	200.0	11.5	0.443
16	20.0	298.9	262.8	12.3	0.414
17	22.0	355.9	319.8	13.0	0.390
18	24.0	407.1	371.0	13.7	0.367
19	26.0	451.2	415.2	14.3	0.348
20	28.0	493.7	457.7	14.9	0.330
21	30.0	524.5	488.4	15.4	0.315
22	35.0	591.0	554.9	16.7	0.281
23	40.0	638.6	602.5	17.7	0.255
D 24	43.4	664.5	628.4	18.4	0.239
SECOND FLOW					
E 1	0.0	52.3			
2	3.0	48.0	-4.3		
3	6.0	48.0	0.0		
4	9.0	48.0	0.0		
5	12.0	49.7	1.7		
6	15.0	50.1	0.4		
7	18.0	50.1	0.0		
8	21.0	51.7	1.6		

REF	MINUTES	PRESSURE	AP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND FLOW - CONTINUED					
9	24.0	51.8	0.1		
10	27.0	51.8	0.0		
F 11	30.3	52.3	0.5		
SECOND CLOSED-IN					
F 1	0.0	52.3			
2	1.0	56.6	4.2	1.0	1.796
3	2.0	59.6	7.3	2.0	1.501
4	3.0	63.9	11.6	2.8	1.340
5	4.0	67.5	15.2	3.8	1.218
6	5.0	71.3	19.0	4.6	1.129
7	6.0	75.8	23.4	5.5	1.057
8	7.0	80.4	28.1	6.3	0.994
9	8.0	84.7	32.4	7.1	0.944
10	9.0	90.0	37.7	7.9	0.898
11	10.0	94.9	42.6	8.6	0.857
12	12.0	104.9	52.6	10.1	0.791
13	14.0	117.8	65.5	11.4	0.736
14	16.0	131.6	79.3	12.7	0.689
15	18.0	147.8	95.5	14.0	0.648
16	20.0	164.2	111.9	15.1	0.614
17	22.0	184.3	132.0	16.2	0.583
18	24.0	209.2	156.9	17.3	0.555
19	26.0	235.3	182.9	18.3	0.530
20	28.0	263.2	210.9	19.3	0.508
21	30.0	292.6	240.3	20.2	0.488
22	35.0	363.6	311.3	22.4	0.443
23	40.0	426.7	374.3	24.4	0.407
G 24	44.4	476.2	423.8	25.9	0.381

REMARKS:

TICKET NO: 47075000

CLOCK NO: 7046 HOUR: 12



HALLIBURTON

 SERVICES

GAUGE NO: 7930

DEPTH: 4589.0

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	32.5			
2	3.0	34.6	2.1		
3	6.0	37.6	3.0		
4	9.0	40.5	2.9		
5	12.0	42.5	2.0		
6	15.0	44.4	1.9		
7	18.0	46.0	1.6		
8	21.0	47.4	1.4		
9	24.0	49.0	1.6		
10	27.0	49.5	0.5		
11	30.0	50.6	1.1		
C 12	31.9	52.1	1.5		
FIRST CLOSED-IN					
C 1	0.0	52.1			
2	1.0	55.2	3.1	1.0	1.503
3	2.0	59.0	6.9	1.9	1.233
4	3.0	62.9	10.8	2.7	1.072
5	4.0	67.7	15.6	3.5	0.954
6	5.0	74.3	22.2	4.3	0.866
7	6.0	79.1	27.0	5.0	0.802
8	7.0	86.3	34.2	5.7	0.744
9	8.0	93.3	41.2	6.4	0.700
10	9.0	101.7	49.6	7.0	0.657
11	10.0	111.6	59.5	7.6	0.621
12	12.0	135.5	83.4	8.7	0.563
13	14.0	167.2	115.1	9.7	0.515
14	16.0	213.2	161.1	10.7	0.476
15	18.0	265.2	213.1	11.5	0.442
16	20.0	326.2	274.2	12.3	0.414
17	22.0	383.2	331.1	13.0	0.389
18	24.0	434.1	382.0	13.7	0.367
19	26.0	474.1	422.0	14.3	0.348
20	28.0	511.6	459.5	14.9	0.330
21	30.0	542.5	490.4	15.4	0.315
22	35.0	608.4	556.3	16.7	0.281
23	40.0	659.9	607.8	17.7	0.254
D 24	43.4	687.6	635.5	18.4	0.239
SECOND FLOW					
E 1	0.0	67.1			
2	3.0	63.5	-3.6		
3	6.0	63.5	0.0		
4	9.0	63.5	0.0		
5	12.0	64.6	1.1		
6	15.0	64.6	0.0		
7	18.0	64.6	0.0		
8	21.0	65.5	0.9		

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND FLOW - CONTINUED					
9	24.0	67.2	1.7		
10	27.0	67.9	0.7		
F 11	30.3	69.0	1.1		
SECOND CLOSED-IN					
F 1	0.0	69.0			
2	1.0	71.9	2.9	1.0	1.787
3	2.0	74.6	5.6	1.9	1.505
4	3.0	77.3	8.4	2.8	1.342
5	4.0	81.3	12.4	3.7	1.220
6	5.0	85.3	16.4	4.6	1.128
7	6.0	88.9	20.0	5.5	1.057
8	7.0	93.8	24.9	6.3	0.994
9	8.0	98.6	29.6	7.1	0.942
10	9.0	103.9	34.9	7.9	0.898
11	10.0	108.4	39.4	8.6	0.857
12	12.0	121.0	52.0	10.1	0.790
13	14.0	134.0	65.1	11.4	0.735
14	16.0	147.9	78.9	12.7	0.689
15	18.0	163.2	94.2	14.0	0.649
16	20.0	181.0	112.1	15.1	0.613
17	22.0	200.0	131.0	16.2	0.583
18	24.0	221.8	152.8	17.3	0.555
19	26.0	247.0	178.0	18.3	0.530
20	28.0	275.6	206.7	19.3	0.508
21	30.0	305.1	236.1	20.2	0.488
22	35.0	380.9	312.0	22.4	0.444
23	40.0	450.1	381.1	24.3	0.407
G 24	44.4	494.7	425.7	25.9	0.381

REMARKS:

		O.D.	I.D.	LENGTH	DEPTH	
1		DRILL PIPE.....	4.500	3.826	4199.0	
3		DRILL COLLARS.....	6.000	2.250	212.0	
50		IMPACT REVERSING SUB.....	6.000	2.750	1.0	4411.0
3		DRILL COLLARS.....	6.000	2.250	121.0	
5		CROSSOVER.....	6.000	2.250	1.0	
11		HANDLING SUB & CHOKE ASSEMBLY...	5.750	3.750	5.0	
12		DUAL CIP VALVE.....	5.000	0.870	5.0	
60		HYDROSPRING TESTER.....	5.000	0.750	5.0	4548.0
80		AP RUNNING CASE.....	5.000	3.060	4.0	4550.0
16		VR SAFETY JOINT.....	5.000	1.000	3.0	
70		OPEN HOLE PACKER.....	6.750	1.530	6.0	4560.0
70		OPEN HOLE PACKER.....	6.750	1.530	6.0	4566.0
20		FLUSH JOINT ANCHOR.....	5.000	2.370	19.0	
83		HT-500 TEMPERATURE CASE.....	5.000	2.440	1.0	4587.0
81		BLANKED-OFF RUNNING CASE.....	5.000		4.0	4589.0
TOTAL DEPTH						4592.0

TEMPERATURE

RECORDER

CHART



10° each circle

Indicated Flow
Capacity

$$kh = \frac{1637 Q_g T}{m}$$

md-ft

Average Effective
Permeability

$$k = \frac{kh}{h}$$

md

Skin Factor

$$S = 1.151 \left[\frac{m(P^*) - m(P_f)}{m} - \text{LOG} \frac{kt}{\phi \mu c_t r_w^2} + 3.23 \right] \text{ ---}$$

Damage Ratio

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

Indicated Flow
Rate (Maximum)

$$AOF_1 = \frac{Q_g m(P^*)}{m(P^*) - m(P_f)}$$

MCFD

Indicated Flow
Rate (Minimum)

$$AOF_2 = Q_g \sqrt{\frac{m(P^*)}{m(P^*) - m(P_f)}}$$

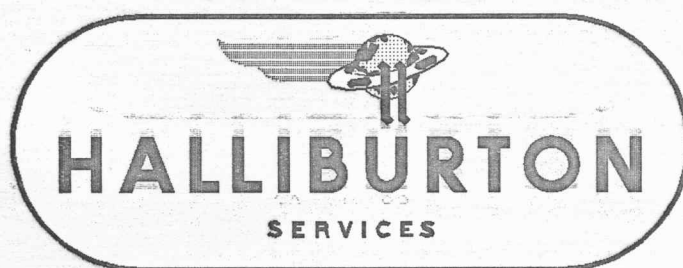
MCFD

Approx. Radius of
Investigation

$$r_i = 0.032 \sqrt{\frac{kt}{\phi \mu c_t}}$$

ft

202



TICKET NO. 65732600

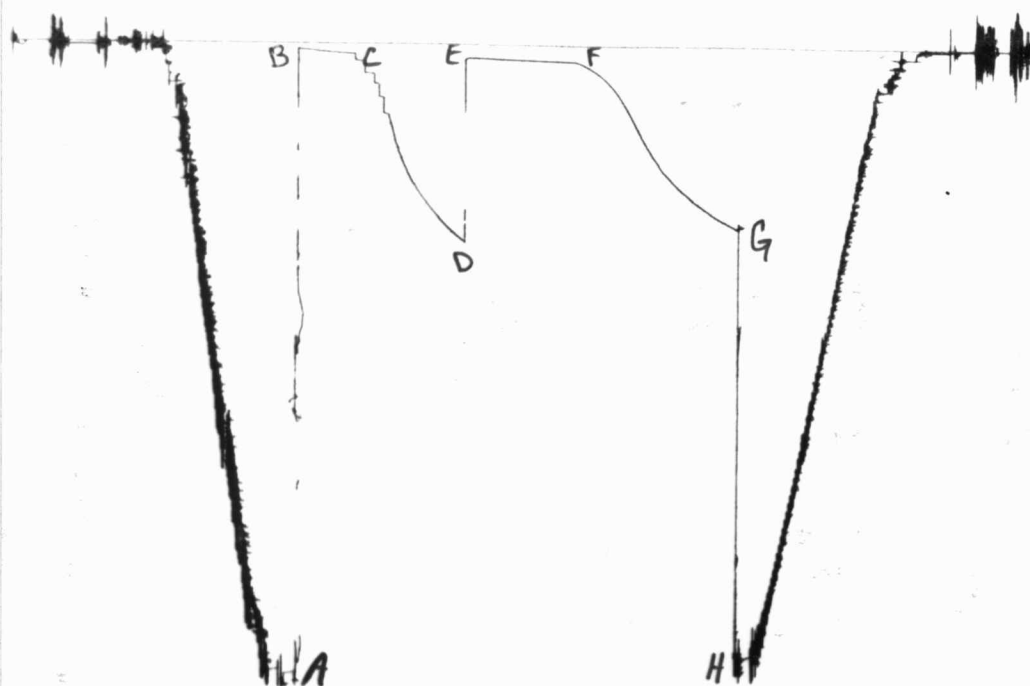
20-JUN-83

PRATT

FORMATION TESTING SERVICE REPORT

KERR ESTATE		2	4	4568.' - 4597.'	VINCENT OIL CORPORATION
LEASE NAME		WELL NO.	TEST NO.	TESTED INTERVAL	LEASE OWNER/COMPANY NAME
LEGAL LOCATION SEC. - TWP. - RNG.	10-29-14		FIELD AREA	COUNTY	PRATT
				STATE	KANSAS
					BC

806



657326-7931

GAUGE NO: 7931 DEPTH: 4552.0 BLANKED OFF: NO HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	2319	2339.3			
B	INITIAL FIRST FLOW	20	20.7			
C	FINAL FIRST FLOW	40	36.7	30.0	31.0	F
C	INITIAL FIRST CLOSED-IN	40	36.7			
D	FINAL FIRST CLOSED-IN	725	732.2	60.0	60.2	C
E	INITIAL SECOND FLOW	40	52.5			
F	FINAL SECOND FLOW	71	62.6	60.0	60.0	F
F	INITIAL SECOND CLOSED-IN	71	62.6			
G	FINAL SECOND CLOSED-IN	675	679.4	90.0	89.8	C
H	FINAL HYDROSTATIC	2250	2268.5			

657326-7930

GAUGE NO: 7930 DEPTH: 4594.0 BLANKED OFF: YES HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC					
B	INITIAL FIRST FLOW					
C	FINAL FIRST FLOW			30.0		F
C	INITIAL FIRST CLOSED-IN					
D	FINAL FIRST CLOSED-IN			60.0		C
E	INITIAL SECOND FLOW					
F	FINAL SECOND FLOW			60.0		F
F	INITIAL SECOND CLOSED-IN					
G	FINAL SECOND CLOSED-IN			90.0		C
H	FINAL HYDROSTATIC					

EQUIPMENT & HOLE DATA

FORMATION TESTED: SIMPSON
 NET PAY (ft): 7.0
 GROSS TESTED FOOTAGE: 29.0
 ALL DEPTHS MEASURED FROM: KB
 CASING PERFS. (ft): _____
 HOLE OR CASING SIZE (in): 7.875
 ELEVATION (ft): 2016
 TOTAL DEPTH (ft): 4597.0
 PACKER DEPTH(S) (ft): 4562. 4568
 FINAL SURFACE CHOKE (in): 1.000
 BOTTOM HOLE CHOKE (in): 0.750
 MUD WEIGHT (lb/gal): 9.30
 MUD VISCOSITY (sec): 44
 ESTIMATED HOLE TEMP. (°F): _____
 ACTUAL HOLE TEMP. (°F): 117 @ 4592.0 ft

TICKET NUMBER: 65732600DATE: 6-15-83 TEST NO: 4TYPE DST: OPEN HOLEHALLIBURTON CAMP:
PRATTTESTER: PARKERWITNESS: HAGEMEIERDRILLING CONTRACTOR:
WHITE AND ELLIS DRILLING COMPANYFLUID PROPERTIES FOR
RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °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:

100' OF SLIGHTLY OIL CUT THIN MUD

MEASURED FROM
TESTER VALVE

REMARKS:

TOP GRINDOUT:	6% OIL	10% WATER	84% MUD
BOTTOM GRINDOUT:	3% OIL	17% WATER	80% MUD

[illegible]

TICKET NO: 65732600

CLOCK NO: 26864 HOUR: 12


HALLIBURTON
SERVICES

GAUGE NO: 7931

DEPTH: 4552.0

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	20.7			
2	3.0	22.6	1.9		
3	6.0	24.2	1.6		
4	9.0	25.8	1.5		
5	12.0	29.0	3.2		
6	15.0	29.9	0.9		
7	18.0	31.8	1.9		
8	21.0	33.2	1.4		
9	24.0	34.8	1.6		
10	27.0	36.4	1.5		
11	30.0	36.4	0.0		
C 12	31.0	36.7	0.3		
FIRST CLOSED-IN					
C 1	0.0	36.7			
☐ 1 2	5.2	65.8	29.1	4.4	0.845
☐ 1 3	10.4	110.6	73.9	7.8	0.600
☐ 1 4	13.0	148.6	111.9	9.2	0.530
☐ 1 5	15.5	201.1	164.4	10.4	0.477
☐ 1 6	18.2	263.0	226.4	11.5	0.432
7	20.0	306.9	270.2	12.2	0.407
8	22.0	364.6	328.0	12.9	0.382
9	24.0	403.5	366.9	13.5	0.360
10	26.0	437.4	400.7	14.2	0.341
11	28.0	466.2	429.5	14.7	0.324
12	30.0	496.9	460.2	15.3	0.308
13	35.0	551.3	514.6	16.5	0.276
14	40.0	598.3	561.6	17.5	0.250
15	45.0	639.9	603.2	18.4	0.228
16	50.0	679.0	642.3	19.2	0.210
17	55.0	709.0	672.3	19.8	0.194
D 18	60.2	732.2	695.5	20.5	0.181
SECOND FLOW					
E 1	0.0	52.5			
2	4.0	49.6	-2.9		
3	8.0	50.7	1.1		
4	12.0	50.7	0.0		
5	16.0	52.8	2.1		
6	20.0	54.0	1.2		
7	24.0	54.9	0.9		
8	28.0	55.5	0.5		
9	32.0	56.6	1.1		
10	36.0	57.6	1.0		
11	40.0	58.5	0.9		
12	44.0	59.1	0.6		
13	48.0	60.1	1.0		

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND FLOW - CONTINUED					
14	52.0	61.0	0.9		
15	56.0	61.0	0.0		
F 16	60.0	62.6	1.6		
SECOND CLOSED-IN					
F 1	0.0	62.6			
2	1.0	65.3	2.6	0.9	1.982
3	2.0	67.8	5.2	2.0	1.663
4	3.0	70.7	8.1	2.9	1.497
5	4.0	73.9	11.3	3.8	1.374
6	5.0	77.7	15.1	4.7	1.284
7	6.0	81.2	18.6	5.6	1.208
8	7.0	84.9	22.3	6.5	1.148
9	8.0	89.0	26.4	7.3	1.095
10	9.0	92.7	30.1	8.2	1.047
11	10.0	97.3	34.6	9.0	1.003
12	12.0	106.1	43.4	10.6	0.935
13	14.0	116.7	54.0	12.1	0.877
14	16.0	128.4	65.8	13.6	0.825
15	18.0	140.8	78.2	15.0	0.782
16	20.0	157.7	95.1	16.4	0.745
17	22.0	175.2	112.5	17.7	0.711
18	24.0	193.4	130.8	19.0	0.680
19	26.0	214.1	151.5	20.2	0.654
20	28.0	236.8	174.1	21.4	0.629
21	30.0	261.7	199.1	22.6	0.606
22	35.0	326.0	263.3	25.3	0.557
23	40.0	387.4	324.7	27.8	0.515
24	45.0	438.8	376.2	30.1	0.481
25	50.0	484.9	422.3	32.3	0.450
26	55.0	520.9	458.3	34.3	0.424
27	60.0	550.7	488.1	36.2	0.401
28	70.0	604.3	541.7	39.6	0.362
29	80.0	649.3	586.7	42.6	0.330
G 30	89.8	679.4	616.8	45.2	0.304

LEGEND:

☐ STAIR STEP

REMARKS:

		O.D.	I.D.	LENGTH	DEPTH	
1		DRILL PIPE.....	4.500	3.826	4201.0	
3		DRILL COLLARS.....	6.000	2.250	212.0	
50		IMPACT REVERSING SUB.....	6.000	2.750	1.0	4413.0
3		DRILL COLLARS.....	6.000	2.250	121.0	
5		CROSSOVER.....	6.000	2.250	1.0	
11		HANDLING SUB & CHOKE ASSEMBLY...	5.750	3.750	5.0	
12		DUAL CIP VALVE.....	5.000	0.870	5.0	
60		HYDROSPRING TESTER.....	5.000	0.750	5.0	4550.0
80		AP RUNNING CASE.....	5.000	3.060	4.0	4552.0
16		VR SAFETY JOINT.....	5.000	1.000	3.0	
70		OPEN HOLE PACKER.....	6.750	1.530	6.0	4562.0
70		OPEN HOLE PACKER.....	6.750	1.530	6.0	4568.0
20		FLUSH JOINT ANCHOR.....	5.000	2.370	22.0	
83		HT-500 TEMPERATURE CASE.....	5.000	2.440	1.0	4592.0
81		BLANKED-OFF RUNNING CASE.....	5.000		4.0	4594.0
TOTAL DEPTH					4597.0	

TEMPERATURE

RECORDER

CHART

10° each circle



Indicated Flow
Capacity

$$kh = \frac{1637 Q_g T}{m}$$

md-ft

Average Effective
Permeability

$$k = \frac{kh}{h}$$

md

Skin Factor

$$S = 1.151 \left[\frac{m(P^*) - m(P_f)}{m} - \text{LOG} \frac{kt}{\phi \mu c_t r_w^2} + 3.23 \right] \text{ ---}$$

Damage Ratio

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

Indicated Flow
Rate (Maximum)

$$AOF_1 = \frac{Q_g m(P^*)}{m(P^*) - m(P_f)}$$

MCFD

Indicated Flow
Rate (Minimum)

$$AOF_2 = Q_g \sqrt{\frac{m(P^*)}{m(P^*) - m(P_f)}}$$

MCFD

Approx. Radius of
Investigation

$$r_i = 0.032 \sqrt{\frac{kt}{\phi \mu c_t}}$$

ft

634



TICKET NO. 65732700

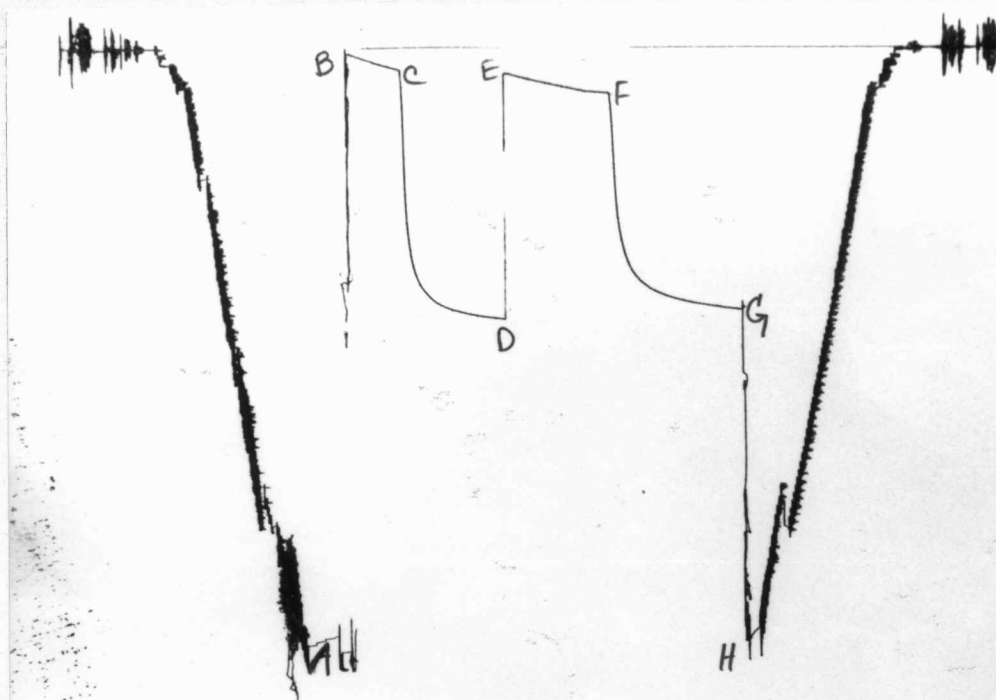
20-JUN-83

PRATT

FORMATION TESTING SERVICE REPORT

KERR ESTATE	2	5	4611.1' - 4629.1'	VINCENT OIL CORPORATION
LEASE NAME	WELL NO.	TEST NO.	TESTED INTERVAL	LEASE OWNER/COMPANY NAME
LEGAL LOCATION SEC. - TWP. - RNG.	10-29-14	FIELD AREA	COUNTY	PRATT
			STATE	KANSAS
				BC

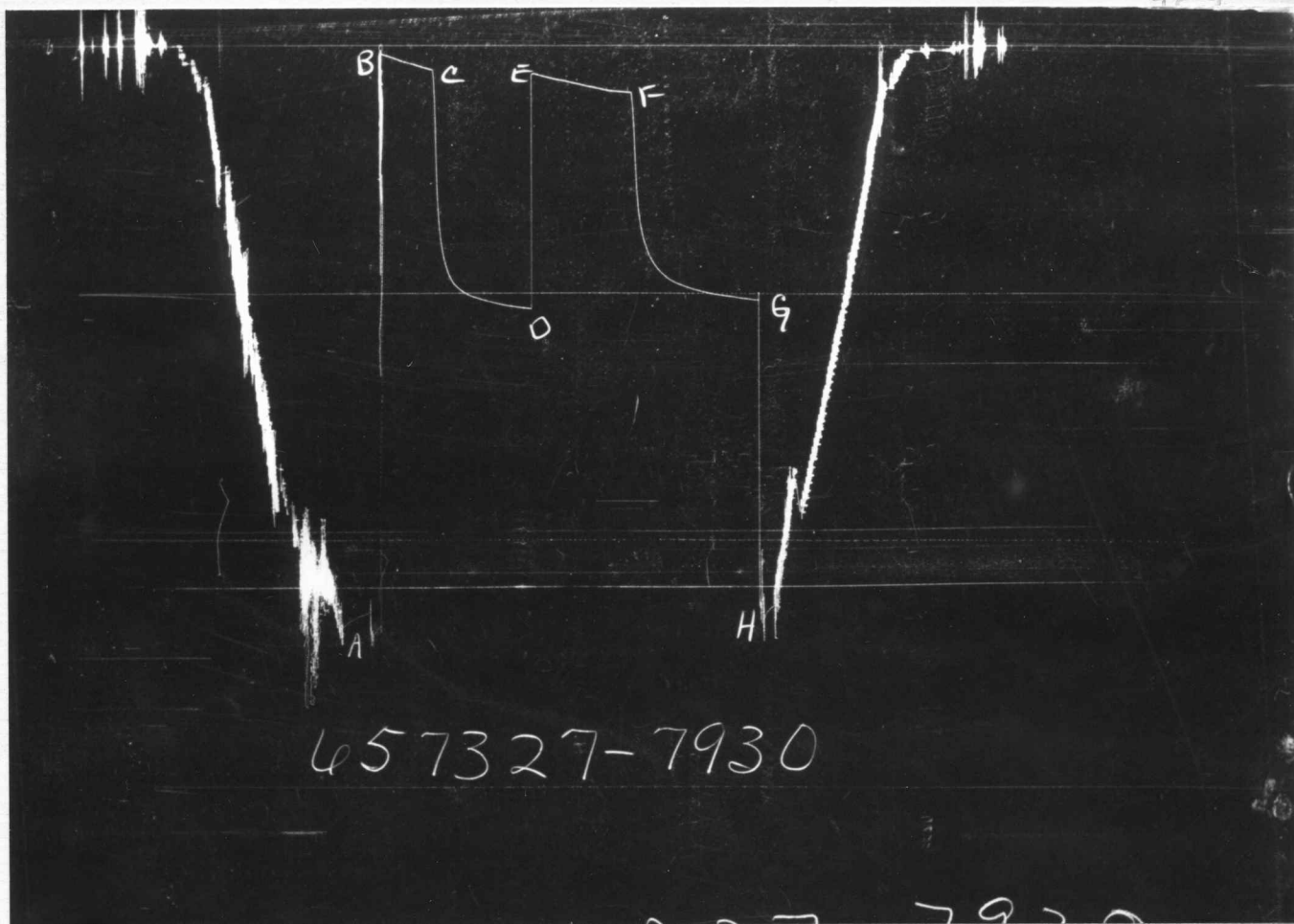
d89



657327-7931

GAUGE NO: 7931 DEPTH: 4595.0 BLANKED OFF: NO HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC		2277.3			
B	INITIAL FIRST FLOW		22.0			
C	FINAL FIRST FLOW		85.5	30.0	31.5	F
C	INITIAL FIRST CLOSED-IN		85.5			
D	FINAL FIRST CLOSED-IN		1051.4	60.0	58.8	C
E	INITIAL SECOND FLOW		99.1			
F	FINAL SECOND FLOW		175.4	60.0	59.9	F
F	INITIAL SECOND CLOSED-IN		175.4			
G	FINAL SECOND CLOSED-IN		1016.4	75.0	76.2	C
H	FINAL HYDROSTATIC		2256.2			



GAUGE NO: 7930 DEPTH: 4626.0 BLANKED OFF: YES HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	2281	2291.8			
B	INITIAL FIRST FLOW	20	34.5			
C	FINAL FIRST FLOW	100	97.7	30.0	31.5	F
C	INITIAL FIRST CLOSED-IN	100	97.7			
D	FINAL FIRST CLOSED-IN	1035	1063.8	60.0	58.8	C
E	INITIAL SECOND FLOW	100	112.6			
F	FINAL SECOND FLOW	180	187.4	60.0	59.9	F
F	INITIAL SECOND CLOSED-IN	180	187.4			
G	FINAL SECOND CLOSED-IN	1025	1029.5	75.0	76.2	C
H	FINAL HYDROSTATIC	2281	2269.0			

EQUIPMENT & HOLE DATA

FORMATION TESTED: SIMPSON
 NET PAY (ft): _____
 GROSS TESTED FOOTAGE: 18.0
 ALL DEPTHS MEASURED FROM: KB
 CASING PERFS. (ft): _____
 HOLE OR CASING SIZE (in): 7.875
 ELEVATION (ft): 2016
 TOTAL DEPTH (ft): 4629.0
 PACKER DEPTH(S) (ft): 4605, 4611
 FINAL SURFACE CHOKE (in): 1.000
 BOTTOM HOLE CHOKE (in): 0.750
 MUD WEIGHT (lb/gal): 9.30
 MUD VISCOSITY (sec): 44
 ESTIMATED HOLE TEMP. (°F): _____
 ACTUAL HOLE TEMP. (°F): 111 @ 4624.0 ft

TICKET NUMBER: 65732700

DATE: 6-16-83 TEST NO: 5

TYPE DST: OPEN HOLE

HALLIBURTON CAMP:
PRATT

TESTER: PARKER

WITNESS: HAGEMEIER

DRILLING CONTRACTOR:
WHITE AND ELLIS DRILLING COMPANY

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm

SAMPLER DATA

Pstg 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:

105' OF MUDDY WATER
 350' OF WATER

MEASURED FROM
 TESTER VALVE

REMARKS:

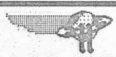
839

[illegible]

689

TICKET NO: 65732700

CLOCK NO: 26864 HOUR: 12


HALLIBURTON
 SERVICES

GAUGE NO: 7931

DEPTH: 4595.0

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	22.0			
2	5.0	28.7	6.7		
3	10.0	42.0	13.3		
4	15.0	52.7	10.7		
5	20.0	63.8	11.1		
6	25.0	73.5	9.7		
7	30.0	82.2	8.7		
C 8	31.5	85.5	3.2		

FIRST CLOSED-IN

C 1	0.0	85.5			
2	4.0	726.1	640.6	3.5	0.951
3	8.0	877.1	791.6	6.4	0.692
4	12.0	931.8	846.3	8.7	0.559
5	16.0	964.5	879.0	10.6	0.472
6	20.0	988.1	902.6	12.2	0.410
7	24.0	1001.6	916.1	13.6	0.364
8	28.0	1013.0	927.5	14.8	0.327
9	32.0	1021.2	935.7	15.9	0.297
10	36.0	1027.7	942.2	16.8	0.273
11	40.0	1034.2	948.7	17.6	0.252
12	44.0	1039.0	953.5	18.3	0.235
13	48.0	1042.9	957.4	19.0	0.219
14	52.0	1047.0	961.5	19.6	0.206
15	56.0	1049.6	964.1	20.1	0.194
D 16	58.8	1051.4	965.9	20.5	0.186

SECOND FLOW

E 1	0.0	99.1			
2	10.0	113.1	14.0		
3	20.0	129.9	16.8		
4	30.0	145.1	15.2		
5	40.0	159.3	14.2		
6	50.0	170.1	10.8		
F 7	59.9	175.4	5.3		

SECOND CLOSED-IN

F 1	0.0	175.4			
2	4.0	634.2	458.8	3.8	1.376
3	8.0	786.2	610.8	7.3	1.095
4	12.0	856.9	681.5	10.6	0.936
5	16.0	895.7	720.3	13.6	0.827
6	20.0	918.6	743.2	16.4	0.745
7	24.0	937.2	761.8	19.0	0.682
8	28.0	950.4	775.0	21.4	0.630
9	32.0	961.5	786.1	23.7	0.586

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND CLOSED-IN - CONTINUED					
10	36.0	970.1	794.7	25.8	0.549
11	40.0	978.0	802.6	27.8	0.517
12	44.0	984.0	808.6	29.7	0.488
13	48.0	990.4	815.0	31.5	0.463
14	52.0	994.9	819.5	33.1	0.441
15	56.0	999.0	823.6	34.7	0.420
16	60.0	1003.8	828.4	36.2	0.402
17	64.0	1007.2	831.8	37.6	0.385
18	68.0	1010.6	835.2	39.0	0.370
19	72.0	1014.0	838.6	40.3	0.356
G 20	76.2	1016.4	841.0	41.6	0.342

REMARKS:

079

TICKET NO: 65732700

CLOCK NO: 7046 HOUR: 12



GAUGE NO: 7930

DEPTH: 4626.0

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	34.5			
2	5.0	43.1	8.6		
3	10.0	56.3	13.2		
4	15.0	67.3	11.0		
5	20.0	75.8	8.6		
6	25.0	86.2	10.4		
7	30.0	95.3	9.1		
C 8	31.5	97.7	2.4		
FIRST CLOSED-IN					
C 1	0.0	97.7			
2	4.0	757.5	659.8	3.5	0.951
3	8.0	900.6	802.9	6.4	0.693
4	12.0	958.5	860.8	8.7	0.559
5	16.0	984.9	887.2	10.6	0.472
6	20.0	1002.8	905.1	12.2	0.411
7	24.0	1015.1	917.4	13.6	0.363
8	28.0	1023.4	925.7	14.8	0.327
9	32.0	1031.2	933.5	15.9	0.297
10	36.0	1038.4	940.7	16.8	0.273
11	40.0	1045.0	947.2	17.6	0.252
12	44.0	1050.8	953.1	18.4	0.234
13	48.0	1054.9	957.1	19.0	0.219
14	52.0	1058.6	960.9	19.6	0.206
15	56.0	1061.8	964.1	20.1	0.194
D 16	58.8	1063.8	966.1	20.5	0.186
SECOND FLOW					
E 1	0.0	112.6			
2	10.0	127.9	15.4		
3	20.0	142.2	14.3		
4	30.0	158.0	15.8		
5	40.0	171.5	13.5		
6	50.0	183.4	12.0		
F 7	59.9	187.4	4.0		
SECOND CLOSED-IN					
F 1	0.0	187.4			
2	4.0	656.5	469.1	3.9	1.374
3	8.0	798.9	611.5	7.3	1.095
4	12.0	865.7	678.2	10.6	0.936
5	16.0	904.6	717.1	13.7	0.826
6	20.0	930.5	743.0	16.4	0.746
7	24.0	949.6	762.2	19.0	0.682
8	28.0	963.0	775.6	21.4	0.630
9	32.0	973.2	785.8	23.7	0.586

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND CLOSED-IN - CONTINUED					
10	36.0	982.2	794.8	25.8	0.549
11	40.0	989.8	802.4	27.8	0.516
12	44.0	996.7	809.3	29.7	0.488
13	48.0	1002.8	815.3	31.5	0.463
14	52.0	1007.2	819.8	33.1	0.441
15	56.0	1011.4	824.0	34.7	0.420
16	60.0	1014.9	827.4	36.2	0.402
17	64.0	1019.2	831.8	37.6	0.385
18	68.0	1023.1	835.6	39.0	0.370
19	72.0	1026.6	839.2	40.3	0.356
G 20	76.2	1029.5	842.1	41.6	0.342

REMARKS:

TICKET NO. 65732700

		O.D.	I.D.	LENGTH	DEPTH	
1		DRILL PIPE.....	4.500	3.826	4244.0	
3		DRILL COLLARS.....	6.000	2.250	212.0	
50		IMPACT REVERSING SUB.....	6.000	2.750	1.0	4456.0
3		DRILL COLLARS.....	6.000	2.250	121.0	
5		CROSSOVER.....	6.000	2.250	1.0	
11		HANDLING SUB & CHOKE ASSEMBLY...	5.750	3.750	5.0	
12		DUAL CIP VALVE.....	5.000	0.870	5.0	
60		HYDROSPRING TESTER.....	5.000	0.750	5.0	4593.0
80		AP RUNNING CASE.....	5.000	3.060	4.0	4595.0
16		VR SAFETY JOINT.....	5.000	1.000	3.0	
70		OPEN HOLE PACKER.....	6.750	1.530	6.0	4605.0
70		OPEN HOLE PACKER.....	6.750	1.530	6.0	4611.0
20		FLUSH JOINT ANCHOR.....	5.000	2.370	11.0	
83		HT-500 TEMPERATURE CASE.....	5.000		1.0	4624.0
81		BLANKED-OFF RUNNING CASE.....	5.000		4.0	4626.0
TOTAL DEPTH					4629.0	

TEMPERATURE

RECORDER

CHART

10° each circle



Indicated Flow
Capacity

$$kh = \frac{\text{Indicated Flow Capacity}}{m}$$

Average Effective
Permeability

$$k = \frac{kh}{h}$$

md

Skin Factor

$$S = 1.151 \left[\frac{m(P^*) - m(P_f)}{m} - \text{LOG} \frac{kt}{\phi \mu c_t r_w^2} + 3.23 \right] \text{ ---}$$

Damage Ratio

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

Indicated Flow
Rate (Maximum)

$$AOF_1 = \frac{Q_g m(P^*)}{m(P^*) - m(P_f)}$$

MCFD

Indicated Flow
Rate (Minimum)

$$AOF_2 = Q_g \sqrt{\frac{m(P^*)}{m(P^*) - m(P_f)}}$$

MCFD

Approx. Radius of
Investigation

$$r_i = 0.032 \sqrt{\frac{kt}{\phi \mu c_t}}$$

ft