

FLUID SAMPLE DATA				Date 10-29-80		Ticket Number 967407	
Sampler Pressure _____ P.S.I.G. at Surface Recovery: Cu. Ft. Gas _____ cc. Oil _____ cc. Water _____ cc. Mud _____ Tot. Liquid cc. _____ Gravity _____ ° API @ _____ °F. Gas/Oil Ratio _____ cu. ft./bbl.				Kind of D.S.T. OPEN HOLE		Halliburton Location NESS CITY	
				Tester THOMPSON		Witness KNOBEL	
				Drilling Contractor EMPHASIS # 6		NM S	
EQUIPMENT & HOLE DATA							
				Formation Tested Topeka			
				Elevation 1842' K.B. _____ Ft.			
				Net Productive Interval _____ Ft.			
				All Depths Measured From Kelly Bushing			
				Total Depth 2983' _____ Ft.			
				Main Hole/Casing Size 9 7/8"			
				Drill Collar Length 248' I.D. 2.25"			
				Drill Pipe Length 2662' I.D. 3.826"			
				Packer Depth(s) 2937' - 2943' _____ Ft.			
				Depth Tester Valve 2920' _____ Ft.			
TYPE		AMOUNT		Depth Back		Surface	
Cushion		NONE		Ft. Pres. Valve		NONE	
						.25" Bottom Choke .75"	
Recovered 65' Feet of mud with oil spots.							
Recovered _____ Feet of							
Recovered _____ Feet of							
Recovered _____ Feet of							
Recovered _____ Feet of							
Recovered _____ Feet of							
Remarks SEE PRODUCTION TEST DATA SHEET...							
TEMPERATURE		Gauge No. 514		Gauge No. 376		Gauge No.	
		Depth: 2922' Ft.		Depth: 2980' Ft.		Depth: _____ Ft.	
		12 Hour Clock		12 Hour Clock		Hour Clock	
Est. _____ °F.		Blanked Off NO		Blanked Off YES		Blanked Off	
2978' @						Tool Opened 02:00	
Actual 96 °F.						Opened Bypass 06:10	
		Pressures		Pressures		Pressures	
		Field	Office	Field	Office	Field	Office
Initial Hydrostatic		-	1584.6	1572	1611.6		
First Period	Flow Initial	-	10.9	55	43.8		
	Flow Final	-	20.1	55	50.2		
	Closed in	-	456.1	483	486.3		
Second Period	Flow Initial	-	29.2	55	71.2		
	Flow Final	-	43.8	73	74.9		
	Closed in	-	440.5	475	473.5		
Third Period	Flow Initial						
	Flow Final						
	Closed in						
Final Hydrostatic		-	1530.4	1554	1566.4		

 Legal Location
 Sec. - Twp. - Rng. 11 - 12S - 16W SE NW SW

 Field Area
 Meas. From Tester Valve -

County

ELLIS

State

KANSAS

Lease Name

Well No.

Test No.

Tested Interval

Lease Owner/Company Name

OSWALD

A-18

1

2943' - 2983'

SOLAR PETROLEUM, INCORPORATED

Casing perms. _____ Bottom choke _____ Surf. temp _____ °F Ticket No. 967407
Gas gravity _____ Oil gravity _____ GOR _____
Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F
INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED _____

[illegible]

Gauge No.		514		Depth		2922'		Clock No.		16165		12 hour		Ticket No.		967407	
First Flow Period		Closed In Pressure		Second Flow Period		Closed In Pressure		Second Flow Period		Closed In Pressure		Third Flow Period		Closed In Pressure		Third Flow Period	
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"
0	.000	10.9	.000	20.1	.000	29.2	.000	.000	43.8								
1	.0243	14.6	.0068	35.6*	.0478	26.5**	.0541	.0541	74.9								
2	.0485	16.4	.0339	103.2	.1160	30.1	.1081	.1081	127.0								
3	.0728	18.2	.0611	233.0	.1843	34.7	.1622	.1622	205.6								
4	.0970	20.1	.0883	328.1	.2525	37.4	.2163	.2163	283.3								
5			.1154	379.3	.3208	41.1	.2703	.2703	338.2								
6			.1426	404.9	.3890	43.8	.3244	.3244	372.9								
7			.1697	420.4			.3785	.3785	393.9								
8			.1969	431.4			.4325	.4325	408.6								
9			.2241	436.9			.4866	.4866	417.7								
10			.2512	442.4			.5407	.5407	424.1								
11			.2784	446.0			.5947	.5947	428.7								
12			.3055	449.7			.6488	.6488	433.2								
13			.3327	451.5			.7029	.7029	436.9								
14			.3598	455.2			.7569	.7569	438.7								
15			.3870	456.1			.8110	.8110	440.5								

Gauge No.		376		Depth		2980'		Clock No.		11079		hour		12	
First Flow Period		Closed In Pressure		Second Flow Period		Closed In Pressure		Second Flow Period		Closed In Pressure		Third Flow Period		Closed In Pressure	
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$
0	.000	43.8	.000	50.2	.000	71.2	.000	.000	74.9						
1	.0263	44.7	.0067	53.9*	.0472	60.3**	.0535	.0535	98.7						
2	.0525	47.5	.0337	106.0	.1145	62.1	.1071	.1071	148.9						
3	.0788	49.3	.0606	231.2	.1819	65.8	.1606	.1606	223.0						
4	.1050	50.2	.0876	340.9	.2493	67.6	.2141	.2141	301.6						
5			.1145	398.5	.3166	71.2	.2677	.2677	361.0						
6			.1415	428.7	.3840	74.9	.3212	.3212	398.5						
7			.1684	447.9			.3747	.3747	422.3						
8			.1954	458.8			.4283	.4283	437.8						
9			.2223	465.2			.4818	.4818	447.9						
10			.2493	471.6			.5353	.5353	454.3						
11			.2762	475.3			.5889	.5889	459.7						
12			.3032	479.9			.6424	.6424	464.3						
13			.3301	482.6			.6959	.6959	468.0						
14			.3570	484.4			.7495	.7495	470.7						
15			.3840	486.3			.8030	.8030	473.5						

Gauge No.		376		Depth		2980'		Clock No.		11079		hour		12	
First Flow Period		Closed In Pressure		Second Flow Period		Closed In Pressure		Second Flow Period		Closed In Pressure		Third Flow Period		Closed In Pressure	
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$
0	.000	43.8	.000	50.2	.000	71.2	.000	.000	74.9						
1	.0263	44.7	.0067	53.9*	.0472	60.3**	.0535	.0535	98.7						
2	.0525	47.5	.0337	106.0	.1145	62.1	.1071	.1071	148.9						
3	.0788	49.3	.0606	231.2	.1819	65.8	.1606	.1606	223.0						
4	.1050	50.2	.0876	340.9	.2493	67.6	.2141	.2141	301.6						
5			.1145	398.5	.3166	71.2	.2677	.2677	361.0						
6			.1415	428.7	.3840	74.9	.3212	.3212	398.5						
7			.1684	447.9			.3747	.3747	422.3						
8			.1954	458.8			.4283	.4283	437.8						
9			.2223	465.2			.4818	.4818	447.9						
10			.2493	471.6			.5353	.5353	454.3						
11			.2762	475.3			.5889	.5889	459.7						
12			.3032	479.9			.6424	.6424	464.3						
13			.3301	482.6			.6959	.6959	468.0						
14			.3570	484.4			.7495	.7495	470.7						
15			.3840	486.3			.8030	.8030	473.5						

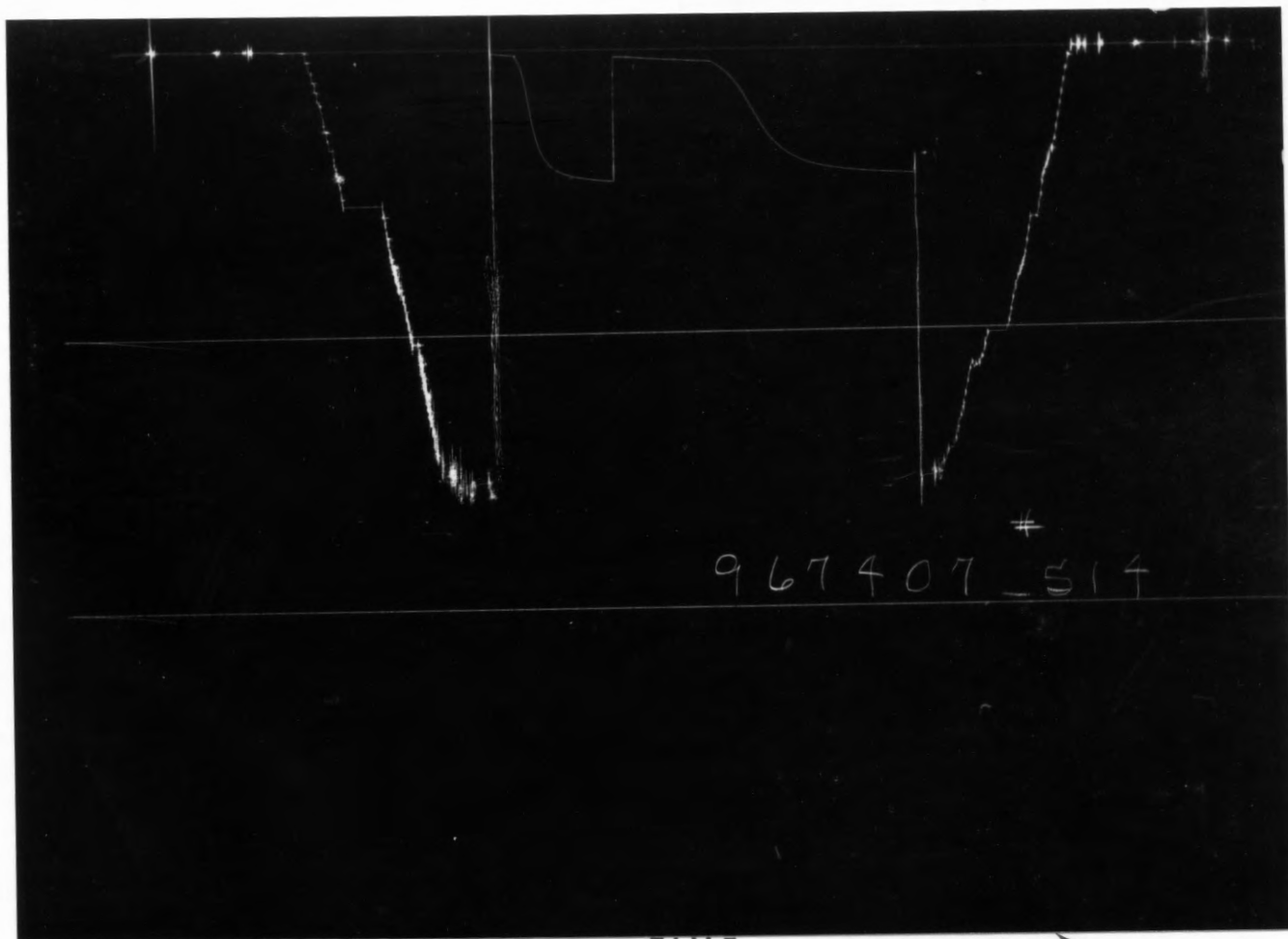
Gauge No.		376		Depth		2980'		Clock No.		11079		hour		12	
First Flow Period		Closed In Pressure		Second Flow Period		Closed In Pressure		Second Flow Period		Closed In Pressure		Third Flow Period		Closed In Pressure	
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$
0	.000	43.8	.000	50.2	.000	71.2	.000	.000	74.9						
1	.0263	44.7	.0067	53.9*	.0472	60.3**	.0535	.0535	98.7						
2	.0525	47.5	.0337	106.0	.1145	62.1	.1071	.1071	148.9						
3	.0788	49.3	.0606	231.2	.1819	65.8	.1606	.1606	223.0						
4	.1050	50.2	.0876	340.9	.2493	67.6	.2141	.2141	301.6						
5			.1145	398.5	.3166	71.2	.2677	.2677	361.0						
6			.1415	428.7	.3840	74.9	.3212	.3212	398.5						
7			.1684	447.9			.3747	.3747	422.3						
8			.1954	458.8			.4283	.4283	437.8						
9			.2223	465.2			.4818	.4818	447.9						
10			.2493	471.6			.5353	.5353	454.3						
11			.2762	475.3			.5889	.5889	459.7						
12			.3032	479.9			.6424	.6424	464.3						
13			.3301	482.6			.6959	.6959	468.0						
14			.3570	484.4			.7495	.7495	470.7						
15			.3840	486.3			.8030	.8030	473.5						

Gauge No.		376		Depth		2980'		Clock No.		11079		hour		12	
First Flow Period		Closed In Pressure		Second Flow Period		Closed In Pressure		Second Flow Period		Closed In Pressure		Third Flow Period		Closed In Pressure	
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$
0	.000	43.8	.000	50.2	.000	71.2	.000	.000	74.9						
1	.0263	44.7	.0067	53.9*	.0472	60.3**	.0535	.0535	98.7						
2	.0525	47.5	.0337	106.0	.1145	62.1	.1071	.1071	148.9						
3	.0788	49.3	.0606	231.2	.1819	65.8	.1606	.1606	223.0						
4	.1050	50.2	.0876	340.9	.2493	67.6	.2141	.2141	301.6						
5			.1145	398.5	.3166	71.2	.2677	.2677	361.0						
6			.1415	428.7	.3840	74.9	.3212	.3212	398.5						
7			.1684	447.9			.3747	.3747	422.3						
8			.1954	458.8			.4283	.4283	437.8						
9			.2223	465.2			.4818	.4818	447.9						
10			.2493	471.6			.5353	.5353	454.3						
11			.2762	475.3			.5889	.5889	459.7						
12			.3032	479.9			.6424	.6424	464.3						
13			.3301	482.6			.6959	.6959	468.0						
14			.3570	484.4			.7495	.7495	470.7						
15			.3840	486.3			.8030	.8030	473.5						

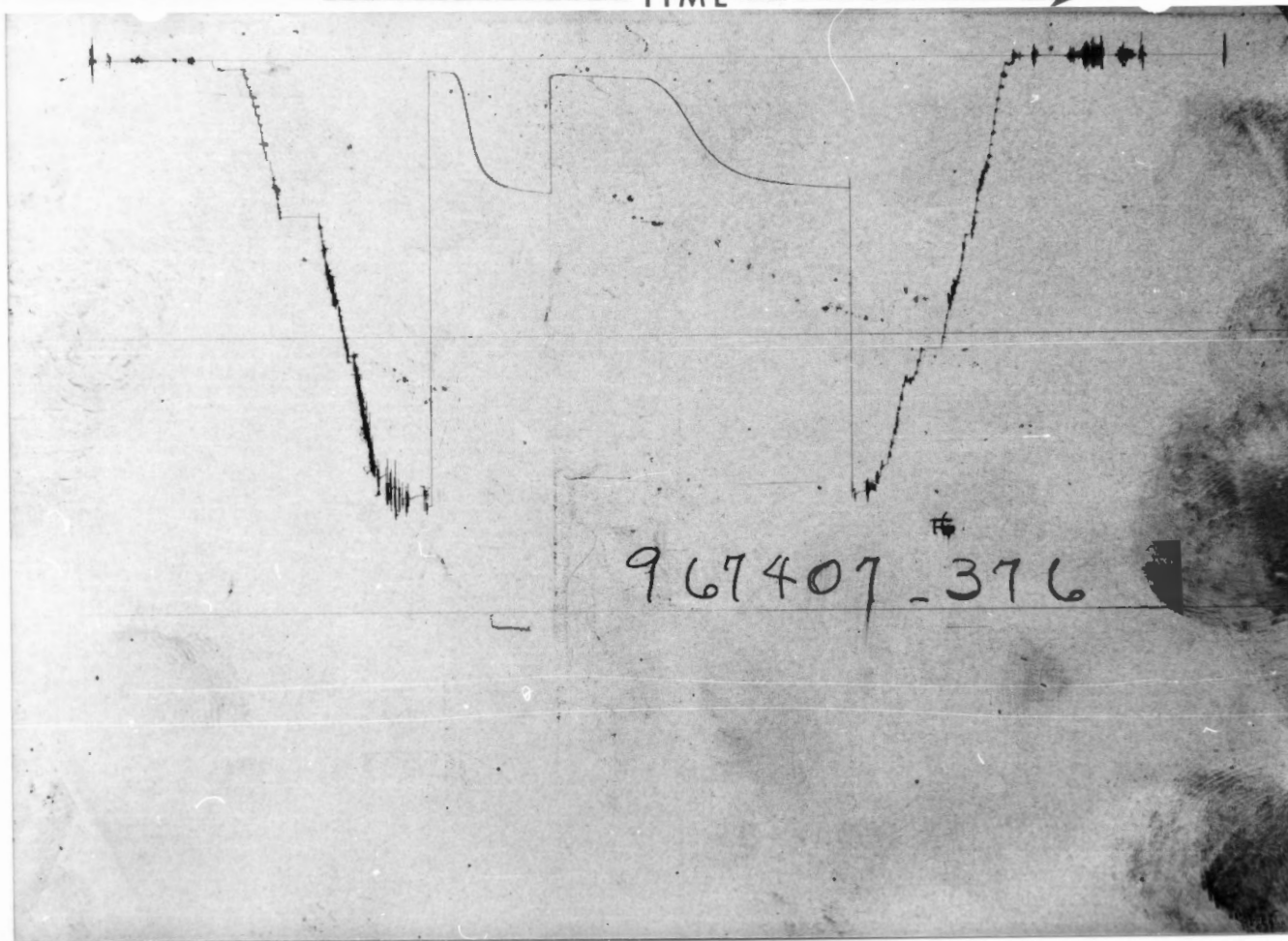
Gauge No.		376		Depth		2980'		Clock No.		11079		hour		12	
First Flow Period		Closed In Pressure		Second Flow Period		Closed In Pressure		Second Flow Period		Closed In Pressure		Third Flow Period		Closed In Pressure	
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t+\theta}{\theta}$
0	.000	43.8	.000	50.2	.000	71.2	.000	.000	74.9						
1	.0263	44.7	.0067	53.9*	.0472	60.3**	.0535	.0535	98.7						
2	.0525	47.5	.0337	106.0	.1145	62.1	.1071	.1071	148.9						
3	.0788	49.3	.0606	231.2	.1819	65.8	.1606	.1606	223.0						
4	.1050	50.2	.0876	340.9	.2493	67.6	.2141	.2141	301.6						
5			.1145	398.5	.3166	71.2	.2677	.2677	361.0						
6			.1415	428.7	.3840	74.9	.3212	.3212	398.5						
7			.1684	447.9			.3747	.3747	422.3						
8</															

	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing				
Drill Collars	5"	3"	1'	2786'
Reversing Sub				
Water Cushion Valve				
Drill Pipe	4½"	3.826"	2662'	
Drill Collars	6.25"	2.25"	248'	
Handling Sub & Choke Assembly				
Dual CIP Valve	5"	.87"	6'	2910'
Dual CIP Sampler				
Hydro-Spring Tester	5"	.75"	5'	2920'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.06"	4'	2922'
Hydraulic Jar	5"	1.75"	5'	
VR Safety Joint	5"	1"	3'	
Pressure Equalizing Crossover				
Packer Assembly	8.75"	1.53"	6'	2937'
Distributor				
Packer Assembly	8.75"	1.53"	6'	2943'
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars HT-500 TEMP CASE	5"	2.25"	1'	
Flush Joint Anchor	5"	3.84"	33'	
Blanked-Off B.T. Running Case	5"	2.44"	4'	2980'
Total Depth				2983'

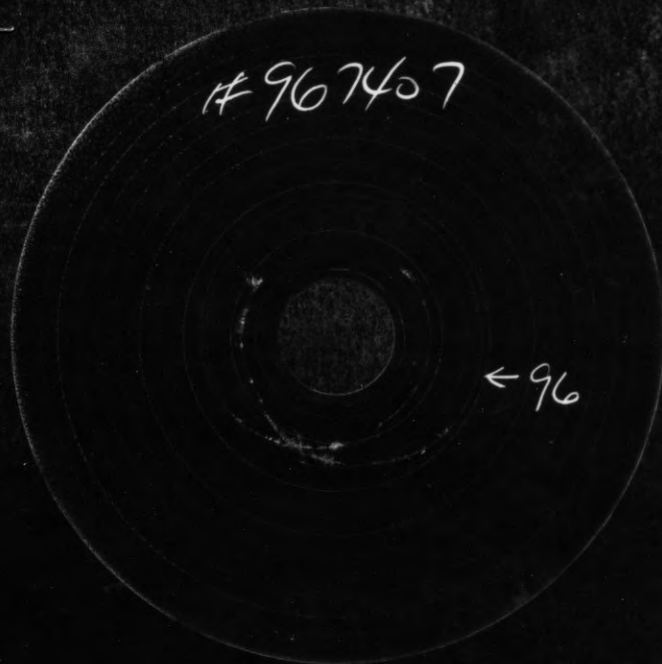
PRESSURE



TIME



TEMPERATURE RECORDER CHART



10° each circle

- OF_3 = Theoretical Open Flow Potential with/Damage Removed Max. . . . MCF/D
 OF_4 = Theoretical Open Flow Potential with/Damage Removed Min. . . . MCF/D
 P_s = Extrapolated Static Pressure Psig.
 P_f = Final Flow Pressure Psig.
 P_{ot} = Potentiometric Surface (Fresh Water *) Feet
 Q = Average Adjusted Production Rate During Test bbls/day
 Q_1 = Theoretical Production w/Damage Removed bbls/day
 Q_g = Measured Gas Production Rate MCF/D
 R = Corrected Recovery bbls
 r_w = Radius of Well Bore Feet
 t = Flow Time Minutes
 t_o = Total Flow Time Minutes
 T = Temperature Rankine °R
 Z = Compressibility Factor —
 μ = Viscosity Gas or Liquid CP
 Log = Common Log

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given, Fresh Water Corrected to 100° F.

FLUID SAMPLE DATA				Date 10-8-80		Ticket Number 967576	
Sampler Pressure _____ P.S.I.G. at Surface				Kind of D.S.T. OPEN HOLE		Halliburton Location HAYS	
Recovery: Cu. Ft. Gas _____				Tester MR. BECKER		Witness MR. KNOBEL	
cc. Oil _____				Drilling Contractor EMPHASIS DRILLING COMPANY #6 bc			
cc. Water _____				EQUIPMENT & HOLE DATA			
cc. Mud _____				Formation Tested Kansas City			
Tot. Liquid cc. _____				Elevation 1878' KB _____ Ft.			
Gravity _____ ° API @ _____ °F.				Net Productive Interval 6' _____ Ft.			
Gas/Oil Ratio _____ cu. ft./bbl.				All Depths Measured From Kelly Bushing			
RESISTIVITY CHLORIDE CONTENT				Total Depth 3114' _____ Ft.			
Recovery Water _____ @ _____ °F. _____ ppm				Main Hole/Casing Size 9 7/8"			
Recovery Mud _____ @ _____ °F. _____ ppm				Drill Collar Length 318' WP I.D. 2.764"			
Recovery Mud Filtrate _____ @ _____ °F. _____ ppm				Drill Pipe Length 2737' I.D. 3.826"			
Mud Pit Sample _____ @ _____ °F. _____ ppm				Packer Depth(s) 3082' - 3088' _____ Ft.			
Mud Pit Sample Filtrate _____ @ _____ °F. _____ ppm				Depth Tester Valve 3065' _____ Ft.			
Mud Weight 9.6 vis 42 sec.							
TYPE		AMOUNT		Depth Back Pres. Valve		Surface Choke	
Cushion				Ft.		Bottom Choke .25"	
Recovered		250 Feet of		Gassey mud with a show of oil			
Recovered				Feet of 70% gas; 3% oil; 2% water; 25% mud			
Recovered		850 Feet of		Gassey mud cut water			
Recovered				Feet of 25% gas; 3% oil; 7% mud; 65% water (See water sampler)			
Recovered				Feet of			
Remarks SEE PRODUCTION TEST DATA SHEET.							
TEMPERATURE		Gauge No. 6178 Depth: 3067' Ft.		Gauge No. 6177 Depth: 3110' Ft.		Gauge No. _____ Depth: _____ Ft.	
Est. _____ °F.		12 Hour Clock		12 Hour Clock		TIME (00:00-24:00 hrs.)	
Blanked Off No		Blanked Off Yes		Blanked Off		Tool Opened 0821	
3109'						Opened Bypass 1231	
Actual 95 °F.		Pressures		Pressures		Pressures	
	Field	Office	Field	Office	Field	Office	Reported Minutes
First Period	Initial Hydrostatic	1635.4	1680	1669.1			Computed Minutes
	Flow Initial	82.9	116	127.9			
	Flow Final	202.4	222	220.9			10 9
Second Period	Closed in	723.6	748	748.9			60 60
	Flow Initial	211.5	222	241.0			
	Flow Final	526.3	549	549.1			60 60
Third Period	Closed in	723.6	748	747.9			120 121
	Flow Initial						
	Flow Final						
Closed in							
Final Hydrostatic		1630.3	1659	1657.5			

Legal Location
Sec. - Twp. - Rng.

11 - 12S - 16W

Field Area
BLUE HILLCounty
ELLISState
KANSASLease Name
OSWALDWell No.
A-17Test No.
2Tested Interval
3088' - 3114'Lease Owner/Company Name
SOLAR PETROLEUM, INCORPORATED

967576

INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED.

[illegible]

Gauge No. 6178		Depth 3067'		Clock No. 2820		12 hour		Ticket No. 967576	
First Flow Period		First Closed In Pressure		Second Flow Period		Second Closed In Pressure		Third Flow Period	
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t + \theta}{\theta}$	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t + \theta}{\theta}$	Time Defl. .000"	PSIG Temp. Corr.
0	.0000 82.9	.0000		.0000	211.5	.0000			526.3
1	.0064 96.1*	.0269		.0665	284.4	.0331			682.1
2	.0193 124.4	.0537		.1330	351.1	.0663			692.2
3	.0322 158.8	.0806		.1995	405.8	.0994			698.3
4	.0451 186.2	.1075		.2660	453.4	.1326			702.4
5	.0580 202.4	.1343		.3325	492.8	.1657			705.4
6		.1612		.3990	526.3	.1988			708.5
7		.1881				.2320			710.5
8		.2149				.2651			712.5
9		.2418				.2983			714.5
10		.2687				.3314			715.5
11		.2955				.4308			717.6
12		.3224				.5302			719.6
13		.3493				.6297			721.7
14		.3761				.7291			722.6
15		.4030				.8020			723.6

Gauge No. 6177		Depth 3110'		Clock No. 2800		12 hour	
0	.0000 127.9	.0000		.0000	241.0		549.1
1	.0063 127.9*	.0265		.0667	301.2		701.8
2	.0190 140.5	.0529		.1333	367.8		714.4
3	.0317 176.5	.0794		.2000	424.9		721.7
4	.0443 202.9	.1059		.2667	474.6		725.9
5	.0570 220.9	.1323		.3333	515.6		729.0
6		.1588		.4000	549.1		731.1
7		.1853					733.2
8		.2117					735.3
9		.2382					737.4
10		.2647					738.4
11		.2911					740.5
12		.3176					743.7
13		.3441					744.7
14		.3705					745.8
15		.3970					747.9
Reading Interval 2		4		10		**	
REMARKS: *Interval = 1 minute		**First 10 intervals = 5 minutes each; next 4 intervals = 15 minutes each; last interval = 11 minutes					

LABORATORY WATER ANALYSIS

TICKET NO. 967576TO SOLAR PETROLEUM, INCORPORATEDDATE 10-8-80

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Submitted by John

Date Rec. _____

Well No. A-17 Depth 3114'Formation KANSAS CITY "B" ZONECounty ELLIS Field BLUE HILL

Source _____

Sample Marked _____

pH _____

Resistivity Ohm m²/m _____

Temperature °F _____

Specific Gravity _____

Chlorides MPL _____

Sampler _____

Pressure _____ PSI

pH _____

Mud _____ cc

Resistivity Ohm m²/m .0136 @ 76°F

Oil _____ cc

Temperature _____

Gas _____ ft.³

Specific Gravity _____

Water _____ cc

Chlorides MPL 31,713

Total Recovery _____ cc

Calcium MPL 2959

Remarks _____

Magnesium MPL 981Sulfates LightIron pH 7.5 Negative

Hydrogen Sulfide Positive 1.040 Sp. Gr.

Analyst: Mr. John Becker

HALLIBURTON COMPANY

cc: _____

By _____

CHEMIST

NOTICE

This report is limited to the described sample tested. Any user of this report agrees that Halliburton shall not be liable for any loss or damage, whether it be to act or omission, resulting from such report or its use.



	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing				
Drill Collars				
Reversing Sub	5.75"	2.75"	1'	2992'
Water Cushion Valve				
Drill Pipe	4 1/2"	3.826"	2737'	
Drill Collars	4 1/2" WP	2.764"	318'	
Handling Sub & Choke Assembly				
Dual CIP Valve	5"	.87"	6'	3055'
Dual CIP Sampler				
Hydro-Spring Tester	5"	.75"	5'	3065'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.06"	4'	3067'
Hydraulic Jar	5"	1.75"	5'	
VR Safety Joint	5"	1"	3'	
Pressure Equalizing Crossover				
Packer Assembly	8.75"	1.68"	6'	3082'
Distributor				
Packer Assembly	8.75"	1.68"	6'	3088'
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor	5"	3.84"	19'	
HT-500	5"	3.75"	1.5'	3109'
Blanked-Off B.T. Running Case	5"	2.44"	4'	3110'
Total Depth				3114'

Gauge No. 6178		Depth 3067'		Clock No. 2820		12 hour		Ticket No. 967576	
First Flow Period		Closed In Pressure		Second Flow Period		Third Flow Period		Closed In Pressure	
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t + \theta}{\theta}$	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.
0	.0000 82.9	.0000	-----	.0000	211.5	.0000	-----	.0000	526.3
1	.0064 96.1*	.0269	.500	.0665	284.4	.0331	1.170	.0331	682.1
2	.0193 124.4	.0537	.318	.1330	351.1	.0663	.897	.0663	692.2
3	.0322 158.8	.0806	.235	.1995	405.8	.0994	.748	.0994	698.3
4	.0451 186.2	.1075	.187	.2660	453.4	.1326	.648	.1326	702.4
5	.0580 202.4	.1343	.156	.3325	492.8	.1657	.575	.1657	705.4
6		.1612	.133	.3990	526.3	.1988	.518	.1988	708.5
7		.1881	.117			.2320	.473	.2320	710.5
8		.2149	.104			.2651	.435	.2651	712.5
9		.2418	.093			.2983	.403	.2983	714.5
10		.2687	.085			.3314	.376	.3314	715.5
11		.2955	.078			.4308	.314	.4308	717.6
12		.3224	.072			.5302	.270	.5302	719.6
13		.3493	.067			.6297	.237	.6297	721.7
14		.3761	.062			.7291	.211	.7291	722.6
15		.4030	.058			.8020	.196	.8020	723.6

Gauge No. 6177		Depth 3110'		Clock No. 2800		12 hour			
0	.0000 127.9	.0000	-----	.0000	241.0	.0000	-----	.0000	549.1
1	.0063 127.9*	.0265	.499	.0667	301.2	.0329	1.173	.0329	701.8
2	.0190 140.5	.0529	.318	.1333	367.8	.0659	.900	.0659	714.4
3	.0317 176.5	.0794	.235	.2000	424.9	.0988	.750	.0988	721.7
4	.0443 202.9	.1059	.187	.2667	474.6	.1317	.650	.1317	725.9
5	.0570 220.9	.1323	.156	.3333	515.6	.1647	.577	.1647	729.0
6		.1588	.133	.4000	549.1	.1976	.520	.1976	731.1
7		.1853	.116			.2305	.475	.2305	733.2
8		.2117	.104			.2635	.437	.2635	735.3
9		.2382	.093			.2964	.405	.2964	737.4
10		.2647	.085			.3293	.378	.3293	738.4
11		.2911	.078			.4281	.315	.4281	740.5
12		.3176	.072			.5269	.271	.5269	743.7
13		.3441	.067			.6257	.238	.6257	744.7
14		.3705	.062			.7245	.212	.7245	745.8
15		.3970	.058			.7970	.197	.7970	747.9
Reading Interval 2		4		10		15		Minutes	
REMARKS: *Interval = 1 minute **First 10 intervals = 5 minutes each; next 4 intervals = 15 minutes each; last interval =									

REMARKS: *Interval = 1 minute **First 10 intervals = 5 minutes each; next 4 intervals = 15 minutes each; last interval = 11 minutes

2

Liquid Production

B.T. Gauge Numbers			6178	6177	Ticket Number	967576
			PRESSURE	PRESSURE		
Initial Hydrostatic			1635.4	1669.1	Elevation	1878 ft.
Final Hydrostatic			1630.3	1657.5	1st Flow	- bbls./day
1st Flow	Initial	Time	82.9	127.9	Indicated Production	27 bbls./day
	Final	9	202.4	220.9	3rd Flow	- bbls./day
	Closed In Pressure	60	723.6	748.9	Drill Collar Length	318 ft.
2nd Flow	Initial	Time	211.5	241.0	Drill Collar I.D.	2.764 in.
	Final	60	526.3	549.1	Drill Pipe Factor	.00142 bbls./ft.
	Closed In Pressure	121	723.6	747.9	Hole Size	9 7/8 in.
3rd Flow	Initial	Time			Footage Tested	4 ft.
	Final				Mud Weight	9.6 lbs./gal.
	Closed In Pressure				Viscosity, Oil or Water	.745 cp
Extrapolated Static Pressure		1st			Oil API Gravity	-
		2nd	453	475	Water Specific Gravity	1.04
		3rd	-		Temperature	96 °F
Slope P/10		1st	-			
		2nd	284	301		
		3rd	-			

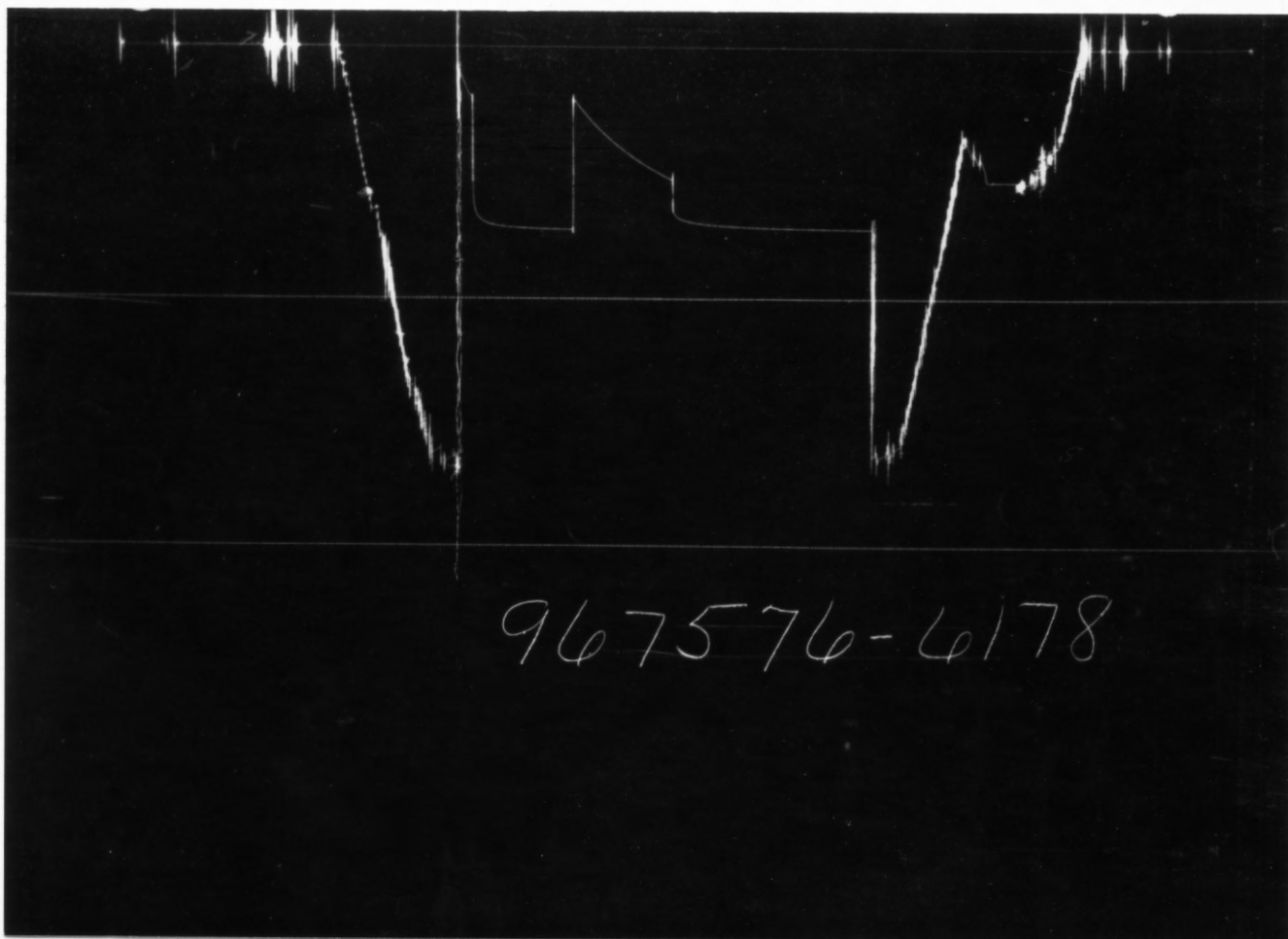
Remarks: Calculations based on 4' net pay as per Mr. Sherwood Artus.

SUMMARY		B.T. Gauge No. 6178 Depth 3067'			B.T. Gauge No. 6177 Depth 3110'			UNITS
PRODUCT	EQUATION	FIRST	SECOND	THIRD	FIRST	SECOND	THIRD	
Production	$Q = \frac{1440 R}{t}$		26			27		bbls. day
Transmissibility	$\frac{Kh}{\mu} = \frac{162.6 Q}{m}$		89.957			94.632		md. ft. cp
Indicated Flow Capacity	$Kh = \frac{Kh}{\mu} \mu$		67.018			70.501		md. ft.
Average Effective Permeability	$K = \frac{Kh}{h}$		-			-		md.
	$K_i = \frac{Kh}{h_i}$		16.755			17.625		md.
Damage Ratio	$DR = .183 \frac{P_s - P_f}{m}$		.806			.824		-
Theoretical Potential w/Damage Removed	$Q_1 = Q DR$		26			27		bbls. day
Approx. Radius of Investigation	$b \approx \sqrt{Kt}$ or $\sqrt{Kt_0}$		-			-		ft.
	$b_1 \approx \sqrt{K_1 t}$ or $\sqrt{K_1 t_0}$		34			35		ft.
Potentiometric Surface *	$Pot. = EI - GD + 2.319 P_s$		511			521		ft.

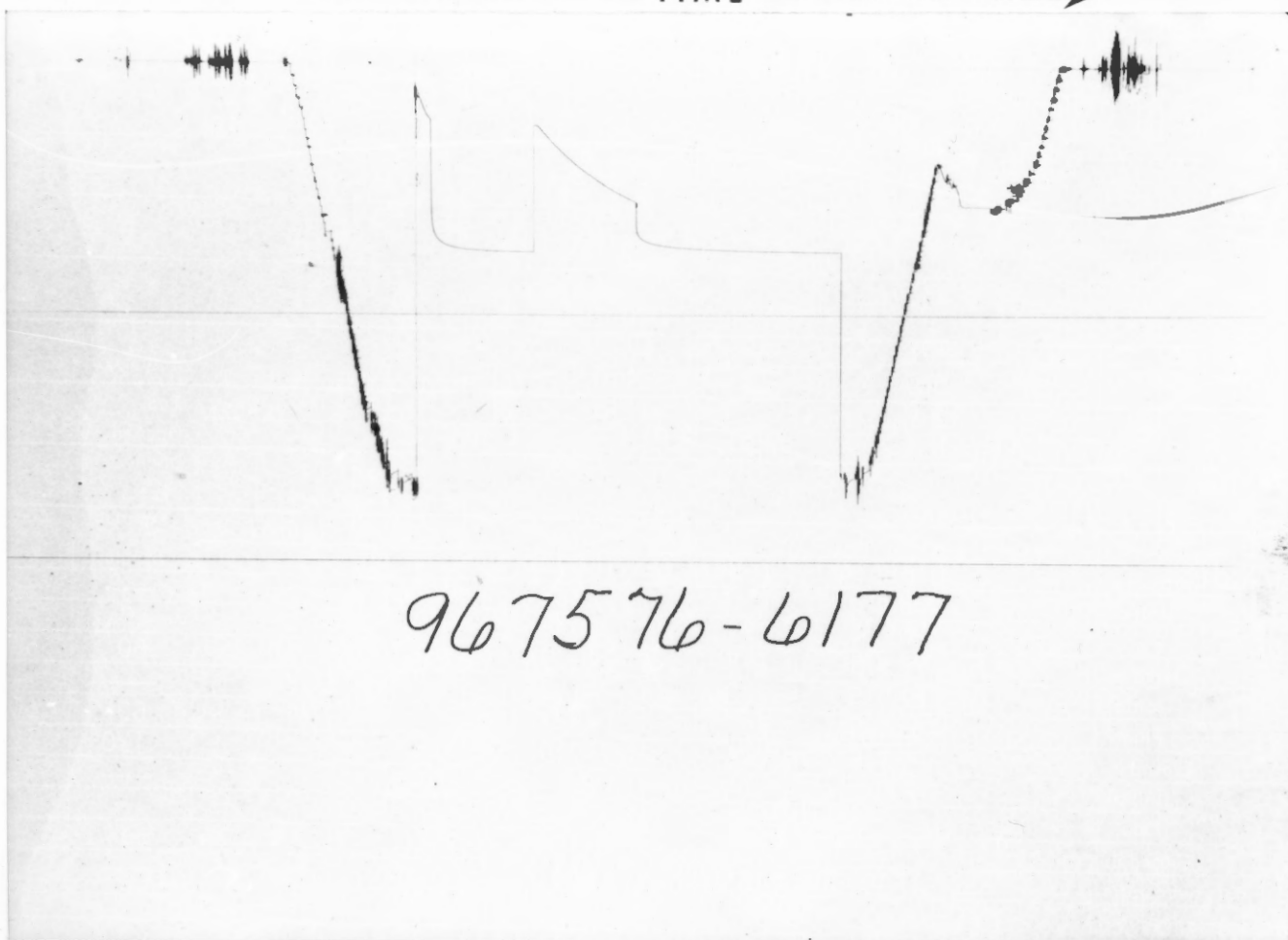
NOTICE. These calculations are based upon information furnished by you and taken from Drill Stem Test pressure charts, and are furnished you for your information. In furnishing such calculations and evaluations based thereon, Halliburton is merely expressing its opinion. You agree that Halliburton makes no warranty express or implied as to the accuracy of such calculations or opinions, and that Halliburton shall not be liable for any loss or damage, whether due to negligence or otherwise, in connection with such calculations and opinions.

(12)

PRESSURE



TIME



TEMPERATURE RECORDER CHART



10° each circle

- OF₃ = Theoretical Open Flow Potential with/Damage Removed Max. . . . MCF/D
- OF₄ = Theoretical Open Flow Potential with/Damage Removed Min. . . . MCF/D
- P_s = Extrapolated Static Pressure Psig.
- P_f = Final Flow Pressure Psig.
- P_{or} = Potentiometric Surface (Fresh Water *) Feet
- Q = Average Adjusted Production Rate During Test bbls/day
- Q₁ = Theoretical Production w/Damage Removed bbls/day
- Q_g = Measured Gas Production Rate MCF/D
- R = Corrected Recovery bbls
- r_w = Radius of Well Bore Feet
- t = Flow Time Minutes
- t_o = Total Flow Time Minutes
- T = Temperature Rankine °R
- Z = Compressibility Factor —
- μ = Viscosity Gas or Liquid CP
- Log = Common Log

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given,
Fresh Water Corrected to 100° F.

FLUID SAMPLE DATA				Date 10-9-80		Ticket Number 967577	
Sampler Pressure _____ P.S.I.G. at Surface Recovery: Cu. Ft. Gas _____ cc. Oil _____ cc. Water _____ cc. Mud _____ Tot. Liquid cc. _____ Gravity _____ ° API @ _____ °F. Gas/Oil Ratio _____ cu. ft./bbl.				Kind of D.S.T. OPEN HOLE TEST J. BECKER Tester D. THOMPSON Witness J. KNOBB Drilling Contractor EMPHASIS DRILLING #6 TJH S		Halliburton Location HAYS	
EQUIPMENT & HOLE DATA							
				Formation Tested Kansas City E Zone			
				Elevation 1878' KB Ft.			
				Net Productive Interval 7' Ft.			
				All Depths Measured From Kelly Bushing			
				Total Depth 3137' Ft.			
				Main Hole/Casing Size 9 7/8"			
				Drill Collar Length 318' W.P.D. 2.764" WP			
				Drill Pipe Length 2761' I.D. 3.826"			
				Packer Depth(s) 3106' - 3112' Ft.			
				Depth Tester Valve 3089' Ft.			
TYPE		AMOUNT		Depth Back		Surface	
Cushion				Ft. Pres. Valve		Choke	
						.25"	
						.75"	
Recovered	260	Feet of	mud cut gassy oil.				
Recovered		Feet of	62% gas, 22% oil, 4% water, 12% mud.				
Recovered	60	Feet of	oil cut gassy mud.				
Recovered		Feet of	63% gas, 8% oil, 6% water, 23% mud.				
Recovered		Feet of					
Remarks SEE PRODUCTION TEST DATA SHEET							
TEMPERATURE		Gauge No. 6178		Gauge No. 6177		Gauge No.	
		Depth: 3091 Ft.		Depth: 3133 Ft.		Depth: Ft.	
		12 Hour Clock		12 Hour Clock		Hour Clock	
Est. °F.		Blanked Off NO		Blanked Off YES		Blanked Off	
3132							
Actual 92 °F.							
		Pressures		Pressures		Pressures	
		Field	Office	Field	Office	Field	Office
Initial Hydrostatic			1653.7	1722	1688.0		
First Period	Flow Initial		25.3	53	53.9		
	Flow Final		59.7	85	81.3		
	Closed in		709.5	738	736.3		
Second Period	Flow Initial		72.8	106	100.4		
	Flow Final		135.6	169	160.6		
	Closed in		689.2	727	714.4		
Third Period	Flow Initial						
	Flow Final						
	Closed in						
Final Hydrostatic			1649.6	1701	1677.5		

Legal Location Sec. - Twp. - Rng. **11 - 12S - 16W**

Field Area **BLUE HILL**

County **ELLIS**

State **KANSAS**

Lease Name **OSWALD**

Well No. **17-A**

Test No. **3**

Tested Interval **3112' - 3137'**

Lease Owner/Company Name **SOLAR PETROLEUM INCORPORATED**

Casing perms. _____ Bottom choke _____ Surf. temp _____ °F Ticket No. 96/577
Gas gravity _____ Oil gravity _____ GOR _____
Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F

INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED.

[illegible]

Gauge No. 6178				Depth 3091				Clock No. 2820				12 hour				Ticket No. 967577							
First Flow Period				First Closed In Pressure				Second Flow Period				Second Closed In Pressure				Third Flow Period				Third Closed In Pressure			
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.		
0	.0000	25.3		.0000	59.7	.0000	72.8	.0000		.0000		.0000		.0000	135.6								
1	.0069*	25.3		.0269	171.0	.0805**	89.0	.0537		.0537		.0537		.0537	261.1								
2	.0207	28.3		.0537	438.2	.1476	101.2	.1073		.1073		.1073		.1073	444.3								
3	.0345	36.4		.0806	579.9	.2147	113.3	.1610		.1610		.1610		.1610	554.6								
4	.0483	42.5		.1074	639.6	.2818	123.4	.2146		.2146		.2146		.2146	602.2								
5	.0621	51.6		.1343	665.9	.3489	131.5	.2683		.2683		.2683		.2683	627.5								
6	.0760	59.7		.1611	678.1	.4160	135.6	.3220		.3220		.3220		.3220	641.6								
7				.1880	686.2			.3756		.3756		.3756		.3756	651.8								
8				.2148	691.2			.4293		.4293		.4293		.4293	659.9								
9				.2417	695.3			.4829		.4829		.4829		.4829	665.9								
10				.2685	698.3			.5366		.5366		.5366		.5366	672.0								
11				.2954	701.4			.5903		.5903		.5903		.5903	676.1								
12				.3222	704.4			.6439		.6439		.6439		.6439	680.1								
13				.3491	706.4			.6976		.6976		.6976		.6976	683.1								
14				.3760	709.5			.7512		.7512		.7512		.7512	687.2								
15								.8050		.8050		.8050		.8050	689.2								

Gauge No. 6177				Depth 3134				Clock No. 2800				12 hour			
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.
0	.0000	53.9		.0000	81.3	.0000	100.4	.0000		.0000		.0000		.0000	160.6
1	.0067*	57.0		.0268	188.1	.0803**	113.1	.0535		.0535		.0535		.0535	285.4
2	.0202	57.0		.0536	439.7	.1473	126.8	.1071		.1071		.1071		.1071	466.1
3	.0336	62.3		.0803	595.1	.2142	137.4	.1606		.1606		.1606		.1606	573.2
4	.0471	69.7		.1071	657.9	.2811	147.9	.2141		.2141		.2141		.2141	625.5
5	.0605	77.1		.1339	687.2	.3480	156.4	.2677		.2677		.2677		.2677	650.6
6	.0740	81.3		.1607	702.9	.4150	160.6	.3212		.3212		.3212		.3212	666.3
7				.1875	712.3			.3747		.3747		.3747		.3747	677.8
8				.2142	717.5			.4282		.4282		.4282		.4282	685.1
9				.2410	721.7			.4818		.4818		.4818		.4818	691.4
10				.2678	724.8			.5353		.5353		.5353		.5353	697.6
11				.2946	728.0			.5888		.5888		.5888		.5888	701.8
12				.3214	731.1			.6424		.6424		.6424		.6424	706.0
13				.3481	733.2			.6959		.6959		.6959		.6959	709.2
14				.3750	736.3			.7494		.7494		.7494		.7494	712.3
15								.8030		.8030		.8030		.8030	714.4

Gauge No. 6177				Depth 3134				Clock No. 2800				12 hour			
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.
0	.0000	53.9		.0000	81.3	.0000	100.4	.0000		.0000		.0000		.0000	160.6
1	.0067*	57.0		.0268	188.1	.0803**	113.1	.0535		.0535		.0535		.0535	285.4
2	.0202	57.0		.0536	439.7	.1473	126.8	.1071		.1071		.1071		.1071	466.1
3	.0336	62.3		.0803	595.1	.2142	137.4	.1606		.1606		.1606		.1606	573.2
4	.0471	69.7		.1071	657.9	.2811	147.9	.2141		.2141		.2141		.2141	625.5
5	.0605	77.1		.1339	687.2	.3480	156.4	.2677		.2677		.2677		.2677	650.6
6	.0740	81.3		.1607	702.9	.4150	160.6	.3212		.3212		.3212		.3212	666.3
7				.1875	712.3			.3747		.3747		.3747		.3747	677.8
8				.2142	717.5			.4282		.4282		.4282		.4282	685.1
9				.2410	721.7			.4818		.4818		.4818		.4818	691.4
10				.2678	724.8			.5353		.5353		.5353		.5353	697.6
11				.2946	728.0			.5888		.5888		.5888		.5888	701.8
12				.3214	731.1			.6424		.6424		.6424		.6424	706.0
13				.3481	733.2			.6959		.6959		.6959		.6959	709.2
14				.3750	736.3			.7494		.7494		.7494		.7494	712.3
15								.8030		.8030		.8030		.8030	714.4

Gauge No. 6177				Depth 3134				Clock No. 2800				12 hour			
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.
0	.0000	53.9		.0000	81.3	.0000	100.4	.0000		.0000		.0000		.0000	160.6
1	.0067*	57.0		.0268	188.1	.0803**	113.1	.0535		.0535		.0535		.0535	285.4
2	.0202	57.0		.0536	439.7	.1473	126.8	.1071		.1071		.1071		.1071	466.1
3	.0336	62.3		.0803	595.1	.2142	137.4	.1606		.1606		.1606		.1606	573.2
4	.0471	69.7		.1071	657.9	.2811	147.9	.2141		.2141		.2141		.2141	625.5
5	.0605	77.1		.1339	687.2	.3480	156.4	.2677		.2677		.2677		.2677	650.6
6	.0740	81.3		.1607	702.9	.4150	160.6	.3212		.3212		.3212		.3212	666.3
7				.1875	712.3			.3747		.3747		.3747		.3747	677.8
8				.2142	717.5			.4282		.4282		.4282		.4282	685.1
9				.2410	721.7			.4818		.4818		.4818		.4818	691.4
10				.2678	724.8			.5353		.5353		.5353		.5353	697.6
11				.2946	728.0			.5888		.5888		.5888		.5888	701.8
12				.3214	731.1			.6424		.6424		.6424		.6424	706.0
13				.3481	733.2			.6959		.6959		.6959		.6959	709.2
14				.3750	736.3			.7494		.7494		.7494		.7494	712.3
15								.8030		.8030		.8030		.8030	714.4

Gauge No. 6177				Depth 3134				Clock No. 2800				12 hour			
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.
0	.0000	53.9		.0000	81.3	.0000	100.4	.0000		.0000		.0000		.0000	160.6
1	.0067*	57.0		.0268	188.1	.0803**	113.1	.0535		.0535		.0535		.0535	285.4
2	.0202	57.0		.0536	439.7	.1473	126.8	.1071		.1071		.1071		.1071	466.1
3	.0336	62.3		.0803	595.1	.2142	137.4	.1606		.1606		.1606		.1606	573.2
4	.0471	69.7		.1071	657.9	.2811	147.9	.2141		.2141		.2141		.2141	625.5
5	.0605	77.1		.1339	687.2	.3480	156.4	.2677		.2677		.2677		.2677	650.6
6	.0740	81.3		.1607	702.9	.4150	160.6	.3212		.3212		.3212		.3212	666.3
7				.1875	712.3			.3747		.3747		.3747		.3747	677.8
8				.2142	717.5			.4282		.4282		.4282		.4282	685.1
9				.2410	721.7			.4818		.4818		.4818		.4818	691.4
10				.2678	724.8			.5353		.5353		.5353		.5353	697.6
11				.2946	728.0			.5888		.5888		.5888		.5888	701.8
12				.3214	731.1			.6424		.6424		.6424		.6424	706.0
13				.3481	733.2			.6959		.6959		.6959		.6959	709.2
14				.3750	736.3			.7494		.7494		.7494		.7494	712.3
15								.8030		.8030		.8030		.8030	714.4

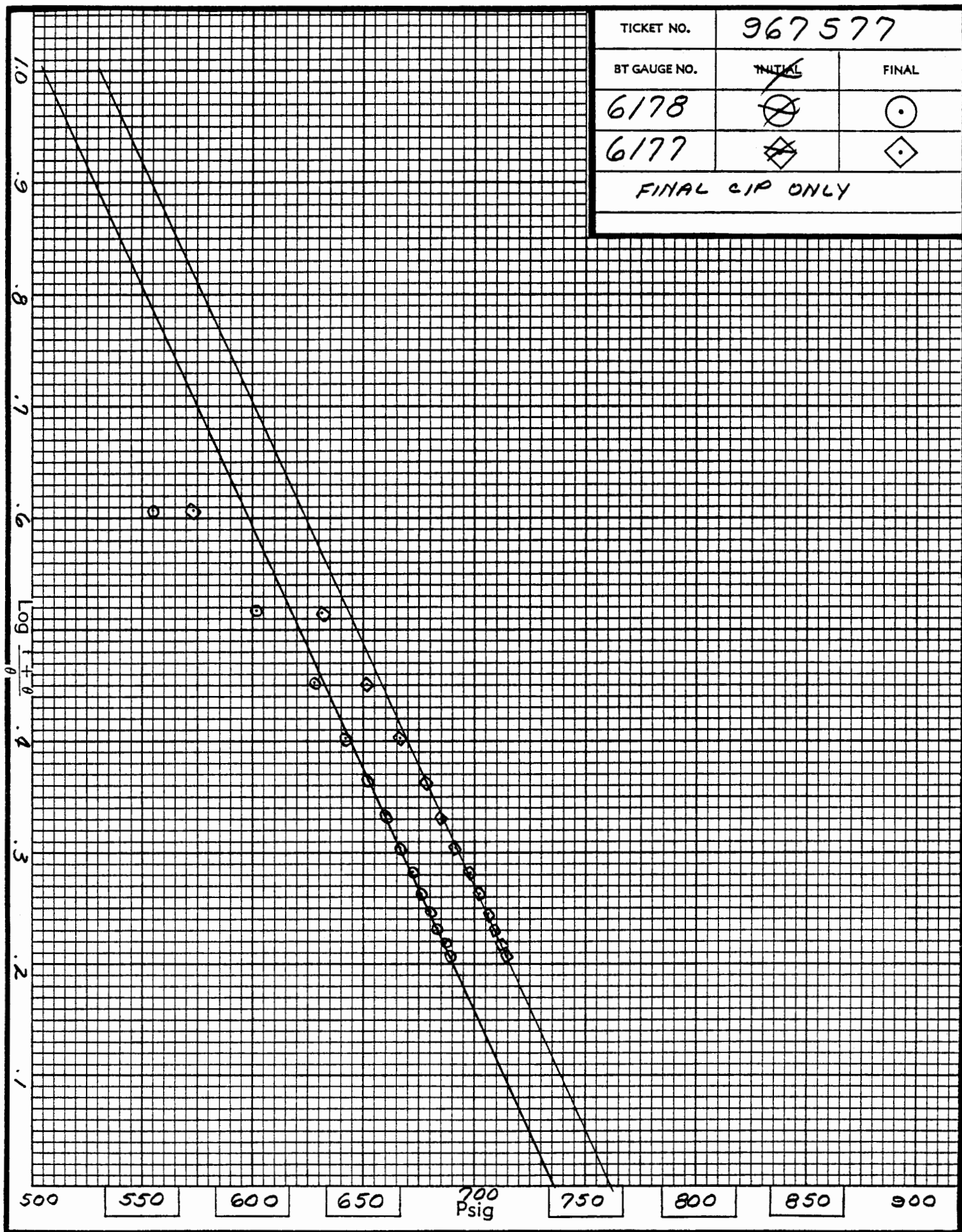
Gauge No. 6177				Depth 3134				Clock No. 2800				12 hour			
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.
0	.0000	53.9		.0000	81.3	.0000	100.4	.0000		.0000		.0000		.0000	160.6
1	.0067*	57.0		.0268	188.1	.0803**	113.1	.0535		.0535		.0535		.0535	285.4
2	.0202	57.0		.0536	439.7	.1473	126.8	.1071							

	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing	4 1/2"	3.826"	2761'	
Drill Collars				
Reversing Sub	5.75"	2.75"	1'	3016'
Water Cushion Valve				
Drill Pipe WEIGHT PIPE	4.5"	2.764"	63'	
Drill Collars				
Handling Sub & Choke Assembly				
Dual CIP Valve	5"	.87"	6'	3079'
Dual CIP Sampler				
Hydro-Spring Tester	5"	.75"	5'	3089'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.06"	4'	3091'
Hydraulic Jar	5"	1.75"	5'	
VR Safety Joint	5"	1"	3'	
Pressure Equalizing Crossover				
Packer Assembly	8.75"	1.68"	6'	3106'
Distributor				
Packer Assembly	8.75"	1.68"	6'	3112'
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor HT-500	5"	3.84"	18'	
	5"	3.75"	1.5'	3132'
Blanked-Off B.T. Running Case	5"	2.44"	4'	3133'
Total Depth				3137'

Gauge No. 6178				Depth 3091				Clock No. 2820				12 hour				Ticket No. 967577							
First Flow Period				First Closed In Pressure				Second Flow Period				Second Closed In Pressure				Third Flow Period				Third Closed In Pressure			
Time Defl. .000"	PSIG Temp. Corr.	Log $t + \frac{\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.		
0	.0000	25.3		.0000	59.7	-----	59.7	.0000	72.8	.0000	-----	.0000	135.6										
1	.0069*	25.3		.0269	171.0	.583	171.0	.0805**	89.0	.0537	1.007	.0537	261.1										
2	.0207	28.3		.0537	438.2	.383	438.2	.1476	101.2	.1073	.747	.1073	444.3										
3	.0345	36.4		.0806	579.9	.288	579.9	.2147	113.3	.1610	.608	.1610	554.6										
4	.0483	42.5		.1074	639.6	.232	639.6	.2818	123.4	.2146	.518	.2146	602.2										
5	.0621	51.6		.1343	665.9	.195	665.9	.3489	131.5	.2683	.452	.2683	627.5										
6	.0760	59.7		.1611	678.1	.168	678.1	.4160	135.6	.3220	.403	.3220	641.6										
7				.1880	686.2	.147	686.2			.3756	.364	.3756	651.8										
8				.2148	691.2	.132	691.2			.4293	.332	.4293	659.9										
9				.2417	695.3	.119	695.3			.4829	.305	.4829	665.9										
10				.2685	698.3	.108	698.3			.5366	.283	.5366	672.0										
11				.2954	701.4	.099	701.4			.5903	.263	.5903	676.1										
12				.3222	704.4	.092	704.4			.6439	.247	.6439	680.1										
13				.3491	706.4	.086	706.4			.6976	.232	.6976	683.1										
14				.3760	709.5	.080	709.5			.7512	.219	.7512	687.2										
15										.8050	.207	.8050	689.2										

Gauge No. 6177				Depth 3134				Clock No. 2800				12 hour			
First Flow Period				First Closed In Pressure				Second Flow Period				Second Closed In Pressure			
Time Defl. .000"	PSIG Temp. Corr.	Log $t + \frac{\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.		
0	.0000	53.9		.0000	81.3	-----	81.3	.0000	100.4	.0000	-----	.0000	160.6		
1	.0067*	57.0		.0268	188.1	.576	188.1	.0803**	113.1	.0535	1.006	.0535	285.4		
2	.0202	57.0		.0536	439.7	.377	439.7	.1473	126.8	.1071	.746	.1071	466.1		
3	.0336	62.3		.0803	595.1	.284	595.1	.2142	137.4	.1606	.607	.1606	573.2		
4	.0471	69.7		.1071	657.9	.228	657.9	.2811	147.9	.2141	.516	.2141	625.5		
5	.0605	77.1		.1339	687.2	.191	687.2	.3480	156.4	.2677	.451	.2677	650.6		
6	.0740	81.3		.1607	702.9	.164	702.9	.4150	160.6	.3212	.402	.3212	666.3		
7				.1875	712.3	.144	712.3			.3747	.363	.3747	677.8		
8				.2142	717.5	.129	717.5			.4282	.331	.4282	685.1		
9				.2410	721.7	.116	721.7			.4818	.304	.4818	691.4		
10				.2678	724.8	.106	724.8			.5353	.282	.5353	697.6		
11				.2946	728.0	.097	728.0			.5888	.263	.5888	701.8		
12				.3214	731.1	.090	731.1			.6424	.246	.6424	706.0		
13				.3481	733.2	.084	733.2			.6959	.231	.6959	709.2		
14				.3750	736.3	.078	736.3			.7494	.218	.7494	712.3		
15										.8030	.207	.8030	714.4		

Reading Interval	2	4	10	8	Minutes
REMARKS:	* - first interval is equal to 1 minute, ** - 12 minutes.				



EXTRAPOLATED PRESSURE GRAPH

Liquid Production

B.T. Gauge Numbers			6178	6177	Ticket Number	967577
			PRESSURE	PRESSURE		
Initial Hydrostatic			1653.7	1688.0	Elevation	1878 ft.
Final Hydrostatic			1649.6	1677.5		
1st Flow	Initial	Time	25.3	53.9	Indicated Production	1st Flow - bbls./day
	Final	11	59.7	81.3	2nd Flow	30 bbls./day
	Closed In Pressure	56	709.5	736.3	3rd Flow	- bbls./day
2nd Flow	Initial		72.8	100.4	Drill Collar Length	318 ft.
	Final	62	135.6	160.6	Drill Collar I.D.	2.764 in.
	Closed In Pressure	120	689.2	714.4	Drill Pipe Factor	.00142 bbls./ft.
3rd Flow	Initial	Time			Hole Size	9 7/8 in.
	Final				Footage Tested	8 ft.
	Closed In Pressure				Mud Weight	9.6 lbs./gal.
Extrapolated			1st -	-	Viscosity, Oil or Water	17 cp
Static Pressure			2nd 736	762	Oil API Gravity	28 -
			3rd -	-	Water Specific Gravity	- -
			1st -	-	Temperature	92 °F
Slope P/10			2nd 505	531		
			3rd -	-		

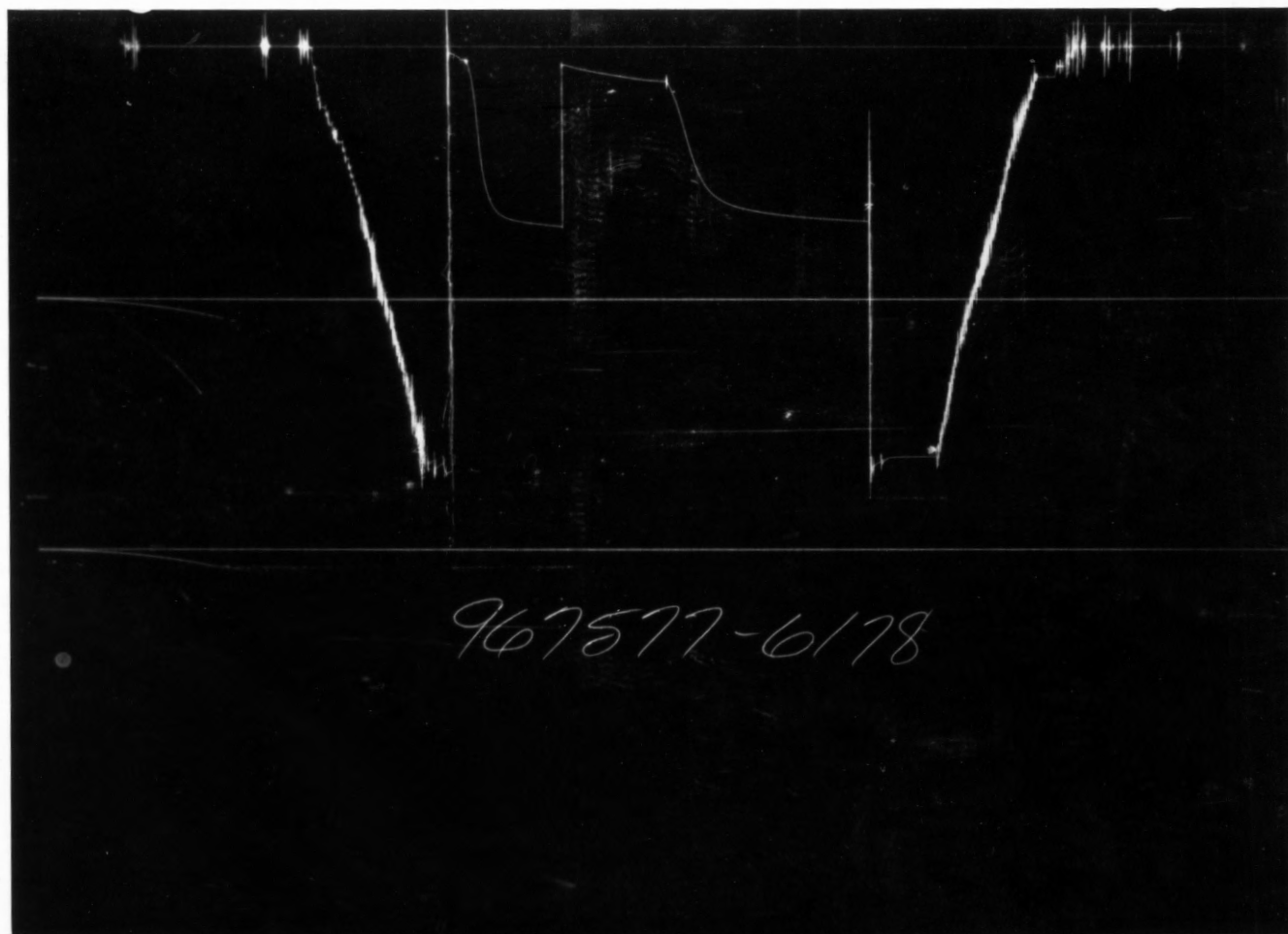
Remarks:

Calculations based on 8' net pay as per Mr. Sherwood Artus.

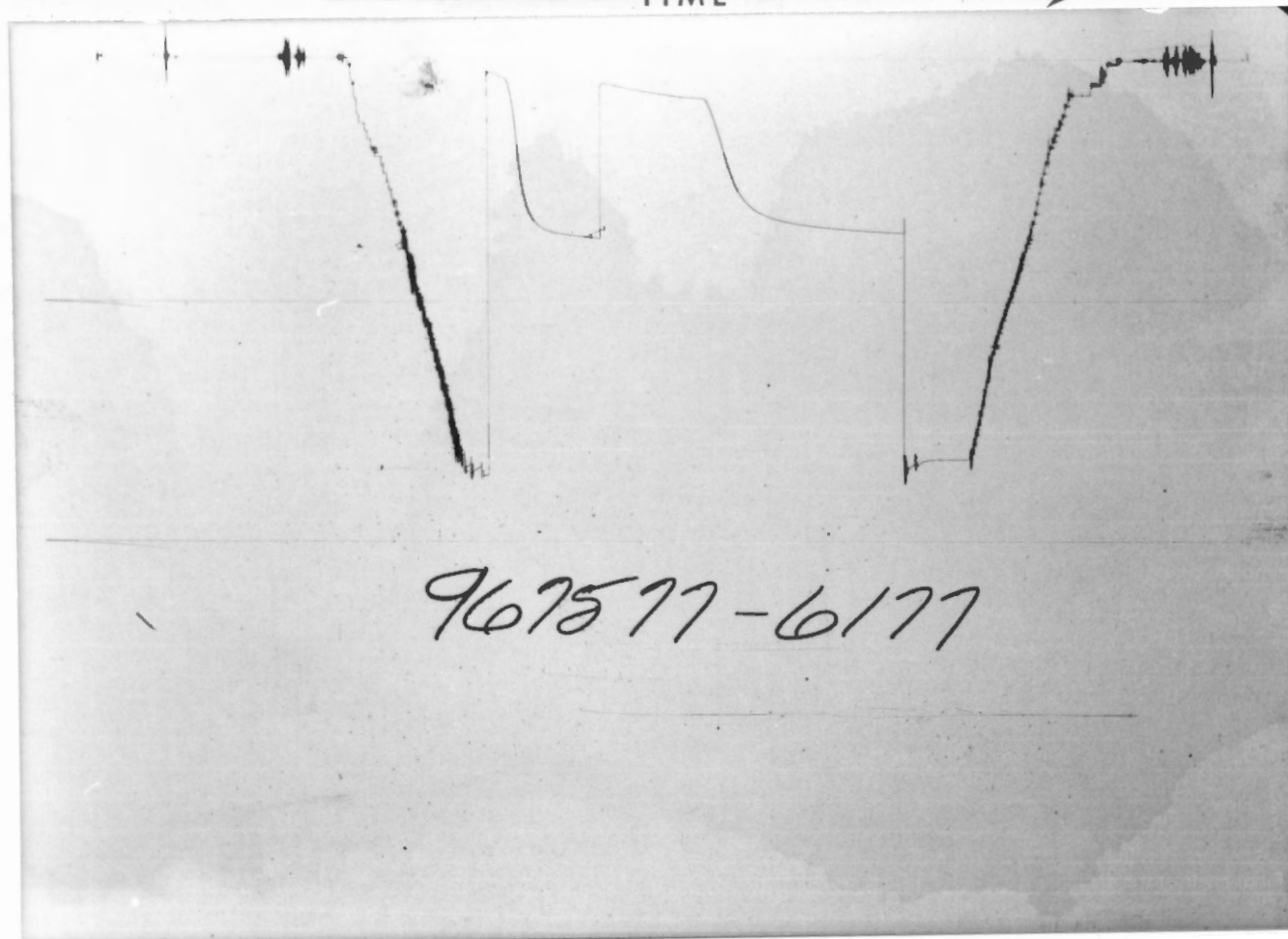
SUMMARY		B.T. Gauge No. 6178			B.T. Gauge No. 6177			
		Depth 3091'			Depth 3133'			
PRODUCT	EQUATION	FIRST	SECOND	THIRD	FIRST	SECOND	THIRD	UNITS
Production	$Q = \frac{1440 R}{t}$		30			30		bbls. day
Transmissibility	$\frac{Kh}{\mu} = \frac{162.6 Q}{m}$		21.049			21.049		$\frac{\text{md. ft.}}{\text{cp}}$
Indicated Flow Capacity	$Kh = \frac{Kh}{\mu} \mu$		357.839			357.839		md. ft.
Average Effective	$K = \frac{Kh}{h}$		-			-		md.
Permeability	$K_i = \frac{Kh}{h_i}$		44.730			44.730		md.
Damage Ratic	$DR = .183 \frac{P_s - P_f}{m}$		.475			.476		—
Theoretical Potential w/Damage Removed	$Q_1 = Q DR$		30			30		bbls. day
Approx. Radius of Investigation	$b \approx \sqrt{Kt}$ or $\sqrt{Kt_0}$		-			-		ft.
	$b_1 \approx \sqrt{K_1 t}$ or $\sqrt{K_1 t_0}$		57			57		ft.
Potentiometric Surface *	$\text{Pot.} = EI - GD + 2.319 P_s$		494			512		ft.

NOTICE: These calculations are based upon information furnished by you and taken from Drill Stem Test pressure charts, and are furnished you for your information. In furnishing such calculations and evaluations based thereon, Halliburton is merely expressing its opinion. You agree that Halliburton makes no warranty, express or implied as to the accuracy of such calculations or opinions, and that Halliburton shall not be liable for any loss or damage, whether due to negligence or otherwise, in connection with such calculations and opinions.

— PRESSURE —
↓



— TIME —→



TEMPERATURE RECORDER CHART

10° each circle



OF_3	= Theoretical Open Flow Potential with/Damage Removed Max.	MCF/D
OF_4	= Theoretical Open Flow Potential with/Damage Removed Min.	MCF/D
P_s	= Extrapolated Static Pressure	Psig.
P_f	= Final Flow Pressure	Psig.
P_{ot}	= Potentiometric Surface (Fresh Water *)	Feet
Q	= Average Adjusted Production Rate During Test	bbls/day
Q_1	= Theoretical Production w/Damage Removed	bbls/day
Q_g	= Measured Gas Production Rate	MCF/D
R	= Corrected Recovery	bbls
r_w	= Radius of Well Bore	Feet
t	= Flow Time	Minutes
t_o	= Total Flow Time	Minutes
T	= Temperature Rankine	°R
Z	= Compressibility Factor	—
μ	= Viscosity Gas or Liquid	CP
Log	= Common Log	

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given,
Fresh Water Corrected to 100° F.

[illegible]

LABORATORY WATER ANALYSIS

TICKET NO. 967578

TO SOLAR PETROLEUM INCORPORATED

DATE 10-10-80

This report is the property of Halliburton Company and neither it nor any part thereof nor a copy thereof is to be published or disclosed without first securing the express written approval of laboratory management; it may however, be used in the course of regular business operations by any person or concern and employees thereof receiving such report from Halliburton Company.

Submitted by _____ Date Rec. _____

Well No. A-17 Depth _____ Formation Kansas City "G"

County _____ Field _____ Source DST # 4

Sample Marked _____

pH _____

Resistivity Ohm m²/m _____

Temperature °F _____

Specific Gravity _____

Chlorides MPL _____

Sampler

Pressure _____ PSI pH _____

Mud _____ cc Resistivity Ohm m²/m 1.54

Oil _____ cc Temperature _____

Gas _____ ft.³ Specific Gravity 1.035

Water _____ cc Chlorides MPL 43245

Total Recovery _____ cc Calcium MPL 4573

Remarks _____ Magnesium MPL 440

Fluid resembles that of Arbuckle formation.

Sulfates Heavy

Iron _____

Analyst: T. Williamson

HALLIBURTON COMPANY

cc:

By _____

CHEMIST

NOTICE

This report is limited to the described sample tested. Any user of this report agrees that Halliburton shall not be liable for any loss or damage, whether it be to act or omission, resulting from such report or its use.

12

Casing perms. _____ Bottom choke _____ Surf. temp. _____ °F Ticket No. 907578
Gas gravity _____ Oil gravity _____ GOR _____
Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F
INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED _____

[illegible]

Gauge No. 6178		Depth 3145'		Clock No. 2820		12 hour		Ticket No. 967578	
First Flow Period		First Closed In Pressure		Second Flow Period		Second Closed In Pressure		Third Flow Period	
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\text{Log } \frac{t + \theta}{\theta}$	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\text{Log } \frac{t + \theta}{\theta}$	Time Defl. .000"	PSIG Temp. Corr.
0 .000	16.1	.000		.000	78.9	.000			
1 .0132	27.3	.0200*		.0658	102.2	.0470**			
2 .0263	38.4	.0467		.1317	122.4	.1007			
3 .0395	46.5	.0735		.1975	142.7	.1544			
4 .0527	53.6	.1002		.2633	155.8	.2081			
5 .0658	59.7	.1269		.3292	164.9	.2619			
6 .0790	67.8	.1536		.3950	173.0	.3156			
7		.1803				.3693			
8		.2070				.4230			
9		.2337				.4767			
10		.2604				.5304			
11		.2871				.5841			
12		.3138				.6379			
13		.3406				.6916			
14		.3673				.7453			
15		.3940				.7990			

Gauge No.		6177		Depth	3180'		Clock No.		2800		hour	12	
0	.000	43.3	.000	84.5	.000	108.8	.000		193.4				
1	.0133	48.6	.0198 *	398.5	.0665	117.3	.0465 *		640.1				
2	.0267	58.1	.0461	693.5	.1330	141.6	.0996		694.5				
3	.0400	66.5	.0725	717.5	.1995	162.7	.1527		710.2				
4	.0533	72.9	.0989	730.1	.2660	176.5	.2058		719.6				
5	.0666	78.2	.1253	738.4	.3325	184.9	.2589		725.9				
6	.0800	84.5	.1516	743.7	.3990	193.4	.3120		731.1				
7			.1780	746.8			.3651		734.3				
8			.2044	749.9			.4182		737.4				
9			.2307	752.0			.4713		740.5				
10			.2571	754.1			.5245		742.6				
11			.2835	756.2			.5776		744.7				
12			.3099	758.3			.6307		746.8				
13			.3362	759.4			.6838		748.9				
14			.3626	760.4			.7369		751.0				
15			.3890	761.5			.7900		752.0				
Reading Interval		2		4		10	8						Minutes



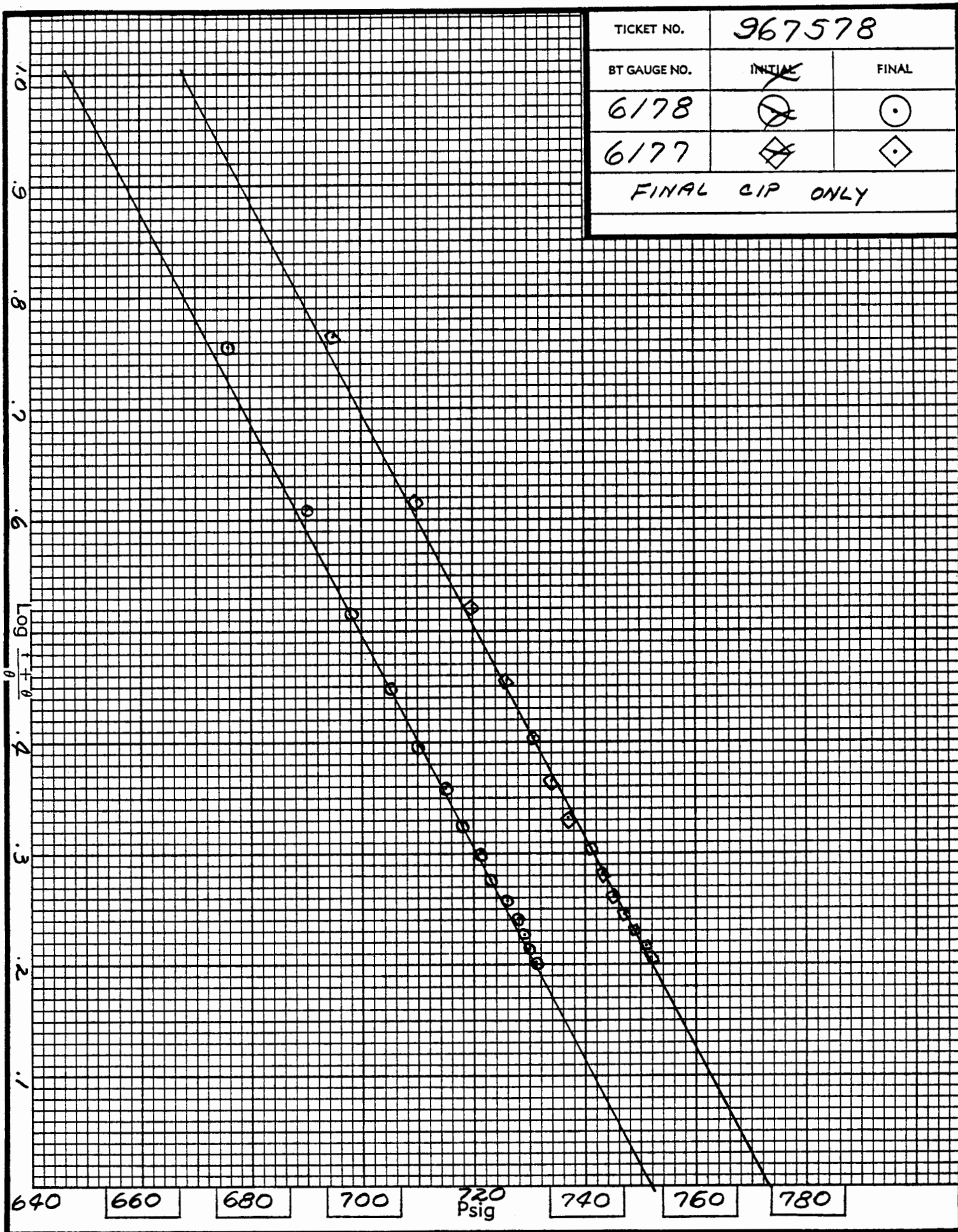
	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing				
Drill Collars				
Reversing Sub	5.75"	2.75"	1'	3070'
Water Cushion Valve				
Drill Pipe	4 1/2"	3.826"	2815'	
Drill Collars	4.5"	2.764"	318' Weight Pipe	
Handling Sub & Choke Assembly				
Dual CIP Valve	5"	.87"	6'	3133'
Dual CIP Sampler				
Hydro-Spring Tester	5"	.75'	5'	3143'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.06"	4'	3145'
Hydraulic Jar	5"	1.75'	5'	
VR Safety Joint	5"	1.0"	3'	
Pressure Equalizing Crossover				
Packer Assembly	8.75"	1.68"	6'	3160'
Distributor				
Packer Assembly	8.75"	1.68"	6'	3166'
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor	5"	3.84"	11'	
	5"	3.75"	1.5'	3179' HT-500
Blanked-Off B.T. Running Case	5"	2.44"	4'	3180'
Total Depth				3184'

Gauge No. 6178		Depth 3145'		Clock No. 2820		12 hour		Ticket No. 967578	
First Flow Period		Closed In Pressure		Second Flow Period		Third Flow Period		Closed In Pressure	
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t + \theta}{\theta}$	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.
0	.000 16.1	.000	----	.000	78.9	.000	----	.000	173.0
1	.0132 27.3	.0200*	.694	.0658	102.2	.0470**	1.045	.617.3	
2	.0263 38.4	.0467	.430	.1317	122.4	.1007	.756	.676.0	
3	.0395 46.5	.0735	.317	.1975	142.7	.1544	.610	.690.2	
4	.0527 53.6	.1002	.252	.2633	155.8	.2081	.516	.698.3	
5	.0658 59.7	.1269	.210	.3292	164.9	.2619	.449	.705.4	
6	.0790 67.8	.1536	.180	.3950	173.0	.3156	.398	.710.4	
7		.1803	.158			.3693	.359	.714.5	
8		.2070	.140			.4230	.326	.717.5	
9		.2337	.126			.4767	.300	.720.6	
10		.2604	.115			.5304	.277	.722.6	
11		.2871	.106			.5841	.258	.725.6	
12		.3138	.098			.6379	.241	.727.6	
13		.3406	.091			.6916	.227	.728.7	
14		.3673	.085			.7453	.214	.729.7	
15		.3940	.079			.7990	.202	.730.7	

Gauge No.		6177		Depth		3180'		Clock No.		2800		hour		12	
0	.000	43.3	.000	----	84.5	.000	108.8	.000	----	193.4					
1	.0133	48.6	.0198 *	.703	398.5	.0665	117.3	.0465 *	1.053	640.1					
2	.0267	58.1	.0461	.437	693.5	.1330	141.6	.0996	.764	694.5					
3	.0400	66.5	.0725	.323	717.5	.1995	162.7	.1527	.617	710.2					
4	.0533	72.9	.0989	.257	730.1	.2660	176.5	.2058	.522	719.6					
5	.0666	78.2	.1253	.214	738.4	.3325	184.9	.2589	.455	725.9					
6	.0800	84.5	.1516	.184	743.7	.3990	193.4	.3120	.404	731.1					
7			.1780	.161	746.8			.3651	.364	734.3					
8			.2044	.143	749.9			.4182	.332	737.4					
9			.2307	.129	752.0			.4713	.305	740.5					
10			.2571	.118	754.1			.5245	.282	742.6					
11			.2835	.108	756.2			.5776	.262	744.7					
12			.3099	.100	758.3			.6307	.245	746.8					
13			.3362	.093	759.4			.6838	.231	748.9					
14			.3626	.087	760.4			.7369	.217	751.0					
15			.3890	.081	761.5			.7900	.206	752.0					
Reading Interval		2	4				10	8							Minutes

REMARKS: * -3 minutes ** -7 minutes

12



EXTRAPOLATED PRESSURE GRAPH

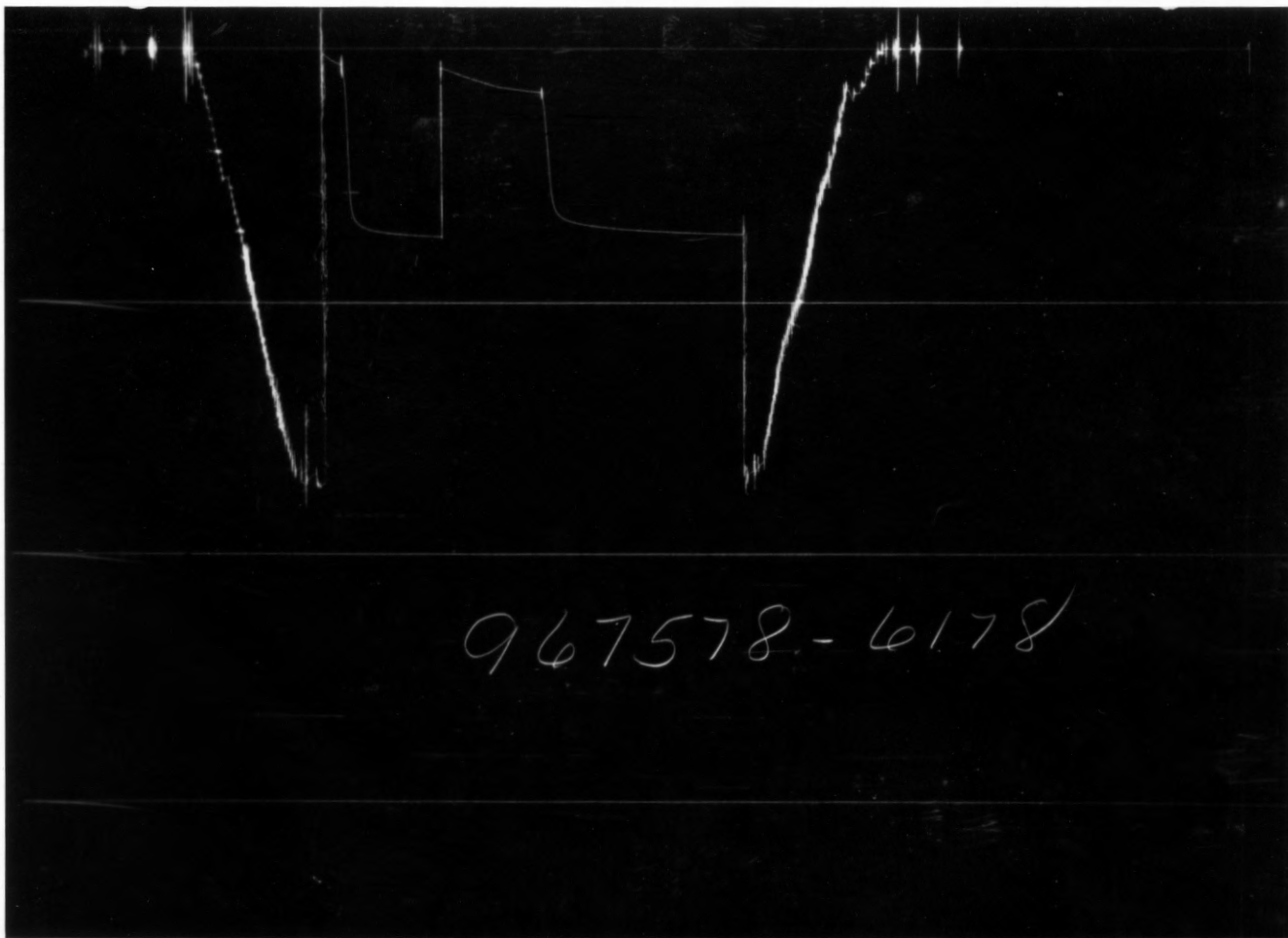
Liquid Production

B.T. Gauge Numbers			6178	6177	Ticket Number	967578
			PRESSURE	PRESSURE		
Initial Hydrostatic			1683.2	1701.0	Elevation	1878 ft.
Final Hydrostatic			1671.0	1697.4	1st Flow	- bbls./day
1st Flow	Initial	Time	16.1	43.3	Indicated Production	2nd Flow 48 bbls./day
	Final	12	67.8	84.5		3rd Flow - bbls./day
	Closed In Pressure	59	740.8	761.5	Drill Collar Length	318 ft.
2nd Flow	Initial	Time	78.9	108.8	Drill Collar I.D.	2.764 in.
	Final	60	173.0	193.4	Drill Pipe Factor	.00142 bbls./ft.
	Closed In Pressure	119	730.7	752.0	Hole Size	9 7/8 in.
3rd Flow	Initial	Time			Footage Tested	7 ft.
	Final				Mud Weight	9.7 lbs./gal.
	Closed In Pressure				Viscosity, Oil or Water	.805 cp
Extrapolated Static Pressure		1st			Oil API Gravity	-
		2nd	752	773	Water Specific Gravity	1.035
		3rd			Temperature	93 °F
Slope P/10		1st				
		2nd	647	668		
		3rd				

Remarks: Calculations based on water production and a net pay of 7' as per Mr. Sherwood Artus.

SUMMARY		B.T. Gauge No. 6178 Depth 3145'			B.T. Gauge No. 6177 Depth 3180'			
PRODUCT	EQUATION	FIRST	SECOND	THIRD	FIRST	SECOND	THIRD	UNITS
Production	$Q = \frac{1440 R}{t}$		43			48		bbls. day
Transmissibility	$\frac{Kh}{\mu} = \frac{162.6 Q}{m}$		66.778			74.198		md. ft. cp
Indicated Flow Capacity	$Kh = \frac{Kh}{\mu} \mu$		53.757			59.729		md. ft.
Average Effective Permeability	$K = \frac{Kh}{h}$		-			-		md.
	$K_i = \frac{Kh}{h_i}$		7.680			8.533		md.
Damage Ratio	$DR = .183 \frac{Ps - Pf}{m}$		1.009			1.011		—
Theoretical Potential w/Damage Removed	$Q_1 = Q DR$		44			48		bbls. day
Approx. Radius of Investigation	$b \approx \sqrt{Kt}$ or $\sqrt{Kt_0}$		-			-		ft.
	$b_1 \approx \sqrt{K_1 t}$ or $\sqrt{K_1 t_0}$		24			25		ft.
Potentiometric Surface *	$Pot. = EI - GD + 2.319 Ps$		477			491		ft.

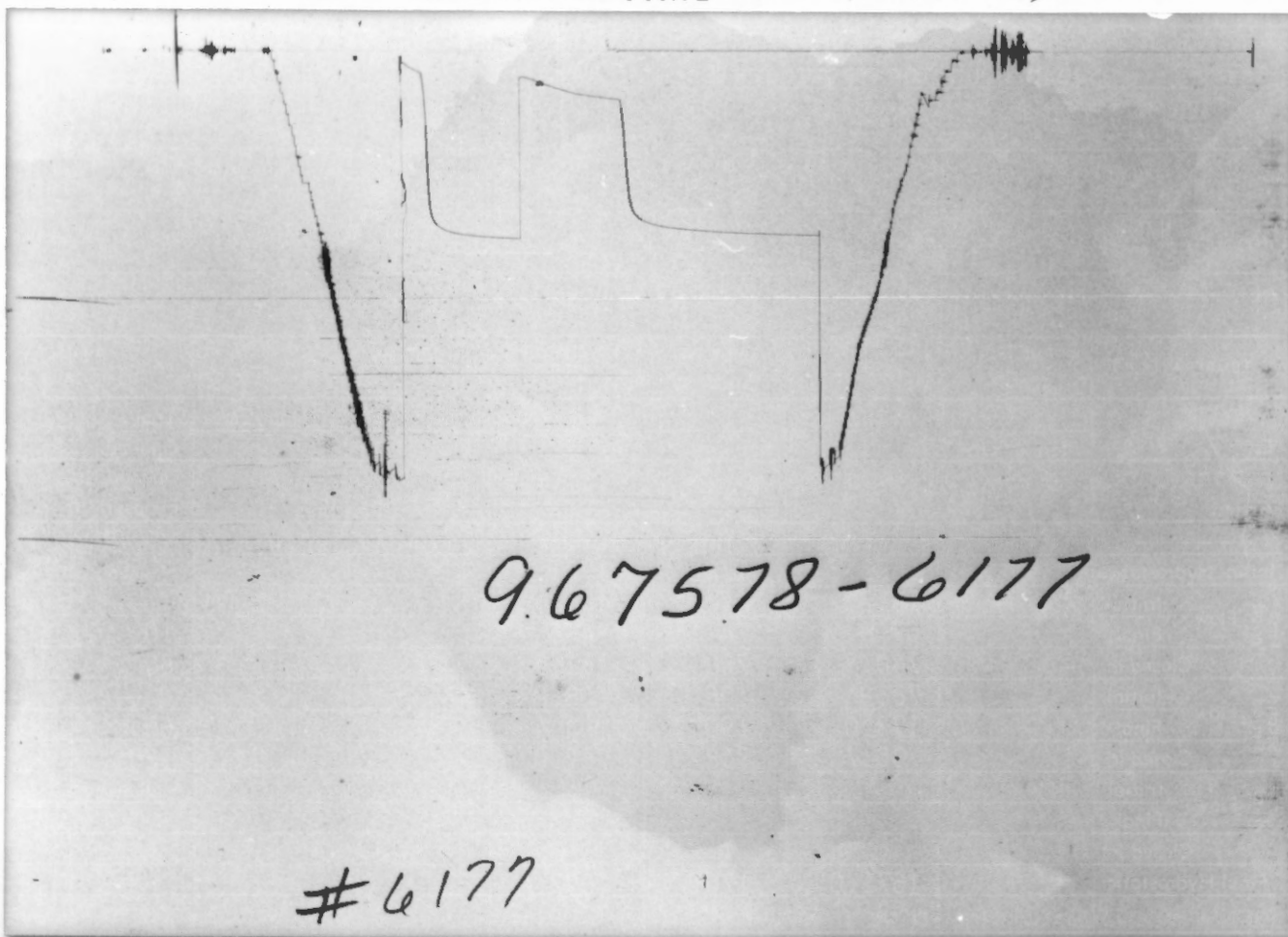
NOTICE: These calculations are based upon information furnished by you and taken from Drill Stem Test pressure charts, and are furnished you for your information. In furnishing such calculations and evaluations based thereon, Halliburton is merely expressing its opinion. You agree that Halliburton makes no warranty express or implied as to the accuracy of such calculations or opinions, and that Halliburton shall not be liable for any loss or damage, whether due to negligence or otherwise, in connection with such calculations and opinions.



967578-6178

PRESSURE

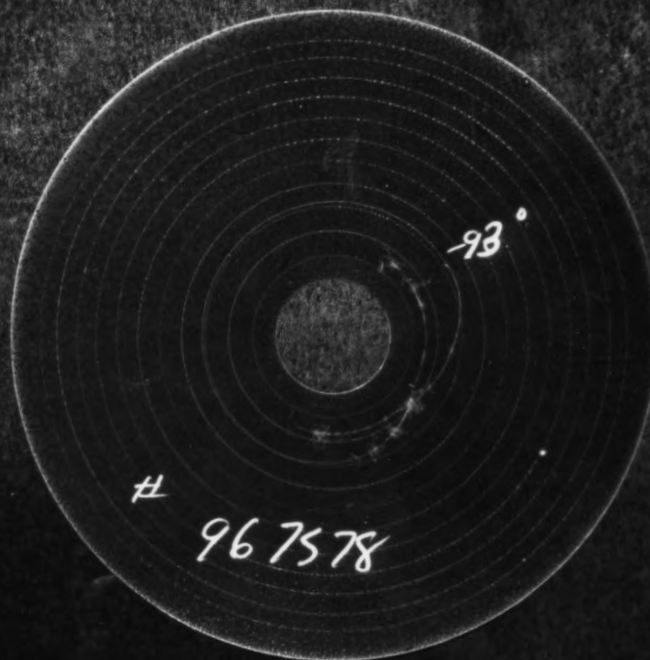
TIME



967578-6177

#6177

TEMPERATURE RECORDER CHART



10° each circle

OF_3	= Theoretical Open Flow Potential with/Damage Removed Max.	MCF/D
OF_4	= Theoretical Open Flow Potential with/Damage Removed Min.	MCF/D
P_s	= Extrapolated Static Pressure	Psig.
P_F	= Final Flow Pressure	Psig.
P_{ot}	= Potentiometric Surface (Fresh Water *)	Feet
Q	= Average Adjusted Production Rate During Test	bbls/day
Q_1	= Theoretical Production w/Damage Removed	bbls/day
Q_g	= Measured Gas Production Rate	MCF/D
R	= Corrected Recovery	bbls
r_w	= Radius of Well Bore	Feet
t	= Flow Time	Minutes
t_o	= Total Flow Time	Minutes
T	= Temperature Rankine	°R
Z	= Compressibility Factor	—
μ	= Viscosity Gas or Liquid	CP
Log	= Common Log	

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given,
Fresh Water Corrected to 100° F.

FLUID SAMPLE DATA				Date 10-15-80		Ticket Number 967580	
Sampler Pressure _____ P.S.I.G. at Surface				Kind of D.S.T. OPEN HOLE		Halliburton Location HAYS	
Recovery: Cu. Ft. Gas _____				Tester MR. BECKER		Witness MR. KNOBLE	
cc. Oil _____				MR. THOMPSON			
cc. Water _____				Drilling Contractor EMPHASIS DRILLING COMPANY #6 bc			
cc. Mud _____				EQUIPMENT & HOLE DATA			
Tot. Liquid cc. _____				Formation Tested Arbuckle			
Gravity _____ ° API @ _____ ° F.				Elevation 1878' KB			
Gas/Oil Ratio _____ cu. ft./bbl.				Net Productive Interval 20'			
RESISTIVITY CHLORIDE CONTENT				All Depths Measured From Kelly Bushing			
Recovery Water _____ @ _____ ° F. _____ ppm				Total Depth 3393'			
Recovery Mud _____ @ _____ ° F. _____ ppm				Main Hole/Casing Size 9 7/8"			
Recovery Mud Filtrate _____ @ _____ ° F. _____ ppm				Drill Collar Length 318' WP I.D. 2.764"			
Mud Pit Sample _____ @ _____ ° F. _____ ppm				Drill Pipe Length 3010' I.D. 3.826"			
Mud Pit Sample Filtrate _____ @ _____ ° F. _____ ppm				Packer Depth(s) 3355' - 3361'			
Mud Weight 10.1 vis 42 sec.				Depth Tester Valve 3338'			
TYPE		AMOUNT		Depth Back		Surface	
Cushion				Ft. Pres. Valve		Choke .25"	
Recovered		375 Feet of		Oil and gas cut mud			
Recovered		Feet of					
Recovered		Feet of					
Recovered		Feet of					
Recovered		Feet of					
Remarks SEE PRODUCTION TEST DATA SHEET.							
TEMPERATURE		Gauge No. 6178		Gauge No. 6177		Gauge No.	
Depth:		3340' Ft.		3390' Ft.		Ft.	
TIME (00:00-24:00 hrs.)		12 Hour Clock		12 Hour Clock		Hour Clock	
Est. _____ ° F.		Blanked Off NO		Blanked Off YES		Blanked Off	
3388'		Pressures		Pressures		Pressures	
Actual 96 ° F.		Field		Office		Field	
		Office		Field		Office	
Initial Hydrostatic		1825.8		1869		1860.2	
First Period	Flow Initial	23.2		53		63.4	
	Flow Final	73.8		106		103.5	
	Closed in	618.4		654		650.6	
Second Period	Flow Initial	82.9		106		120.5	
	Flow Final	187.2		212		217.7	
	Closed in	625.5		654		653.7	
Third Period	Flow Initial						
	Flow Final						
	Closed in						
Final Hydrostatic		1812.6		1869		1842.4	

Legal Location Sec. - Twp. - Rng. **11 - 12S - 16W**
 Lease Name **OSWALD**
 Well No. **A-17**
 Test No. **5**
 Tested Interval **3361' - 3393'**
 County **ELLIS**
 State **KANSAS**
 Lease Owner/Company Name **SOLAR PETROLEUM, INCORPORATED**

967580

Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F

INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED.

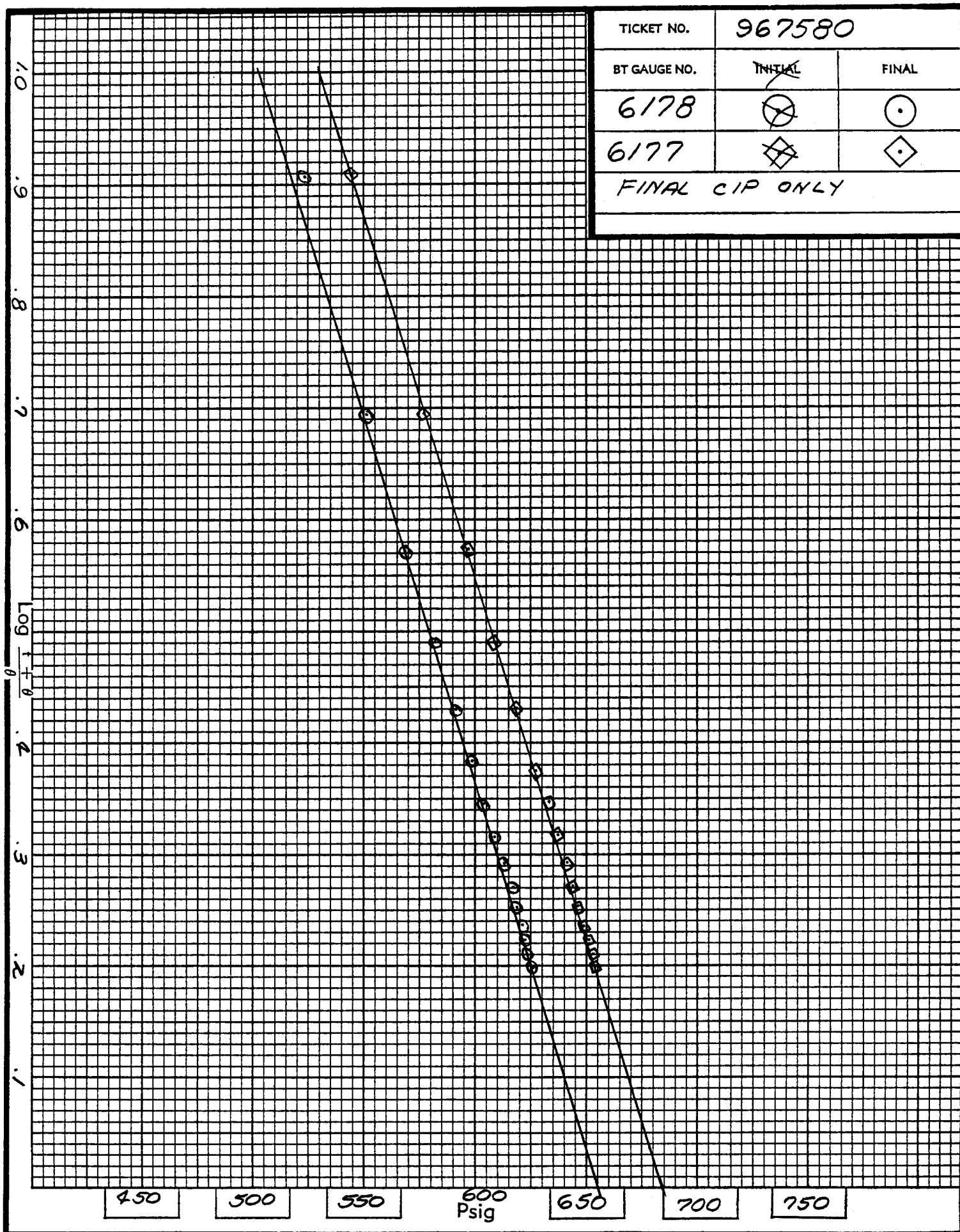
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Gauge No. 6178		Depth 3340'		Clock No. 2820		12 hour		Ticket No. 967580	
First Flow Period		Closed In Pressure		Second Flow Period		Closed In Pressure		Third Flow Period	
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t + \theta}{\theta}$	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t + \theta}{\theta}$	Time Defl. .000"	PSIG Temp. Corr.
0	.0000 23.2	.0000		.0000	82.9	.0000			187.2
1	.0130 34.4	.0338	.520	.0268	95.1**	.0668	.908		519.2***
2	.0260 44.5	.0608	.358	.0604	111.3	.1202	.694		550.6
3	.0390 53.6	.0878	.276	.0940	124.4	.1737	.572		568.8
4	.0520 61.7	.1148	.225	.1274	136.6	.2271	.490		581.9
5	.0650 68.8	.1418	.190	.1611	148.7	.2806	.430		591.0
6	.0780 73.8	.1689	.165	.1946	158.8	.3340	.384		599.1
7		.1959	.146	.2282	166.9	.3875	.347		604.2
8		.2229	.130	.2618	172.0	.4409	.317		609.3
9		.2499	.118	.2953	176.1	.4943	.292		613.3
10		.2769	.108	.3289	181.1	.5478	.271		617.4
11		.3039	.099	.3624	185.2	.6012	.252		619.4
12		.3310	.092	.3960	187.2	.6547	.237		621.4
13		.3580	.086			.7081	.223		623.4
14		.3850	.080			.7615	.210		624.4
15						.8150	.199		625.5

Gauge No. 6177		Depth 3390'		Clock No. 2800		12 hour	
First Flow Period		Closed In Pressure		Second Flow Period		Closed In Pressure	
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t + \theta}{\theta}$	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\log \frac{t + \theta}{\theta}$
0	.0000 63.4	.0000		.0000	120.5	.0000	
1	.0130 64.4	.0336	.521	.0268	124.7**	.0664	.910
2	.0260 72.9	.0605	.360	.0603	139.5	.1195	.695
3	.0390 81.3	.0874	.277	.0937	152.2	.1726	.573
4	.0520 89.8	.1142	.226	.1272	164.9	.2257	.491
5	.0650 96.1	.1411	.191	.1607	177.5	.2789	.431
6	.0780 103.5	.1680	.166	.1941	187.1	.3320	.385
7		.1949	.146	.2276	196.6	.3851	.348
8		.2217	.131	.2611	200.8	.4382	.318
9		.2486	.119	.2946	206.1	.4913	.293
10		.2755	.108	.3280	210.3	.5444	.272
11		.3024	.100	.3615	214.5	.5975	.253
12		.3292	.092	.3950	217.7	.6507	.237
13		.3561	.086			.7038	.223
14		.3830	.081			.7569	.211
15						.8100	.200
Reading Interval 2		4		5		8	

REMARKS: *Interval = 5 minutes **Interval = 4 minutes ***Interval = 10 minutes

12



TICKET NO.	967580	
BT GAUGE NO.	INITIAL	FINAL
6178		
6177		
FINAL CIP ONLY		

EXTRAPOLATED PRESSURE GRAPH

Liquid Production

B.T. Gauge Numbers			6178	6177	Ticket Number		967580	
			PRESSURE	PRESSURE				
Initial Hydrostatic			1825.8	1860.2	Elevation		1878	ft.
Final Hydrostatic			1812.6	1842.4	1st Flow			bbls./day
1st Flow	Initial	Time	23.2	63.4	Indicated Production	2nd Flow	63	bbls./day
	Final	12	73.8	103.5		3rd Flow		bbls./day
	Closed In Pressure	57	618.4	650.6		Drill Collar Length		318 ft.
2nd Flow	Initial		82.9	120.5	Drill Collar I.D.		2.764	in.
	Final		187.2	217.7	Drill Pipe Factor		.01422	bbls./ft.
	Closed In Pressure		625.5	653.7	Hole Size		9 7/8	in.
3rd Flow	Initial	Time			Footage Tested		20	ft.
	Final	59			Mud Weight		10.1	lbs./gal.
	Closed In Pressure	122			Viscosity, Oil or Water			cp
Extrapolated			1st		Oil API Gravity		28	—
Static Pressure			2nd	655	Water Specific Gravity			—
			3rd		Temperature		96	°F
Slope P/10		1st						
		2nd	502	530				
		3rd						

Remarks: It was assumed that all production was 28° API gravity crude oil as per Mr. Sherwood Artus.

No calculations made from initial flow and Closed In Pressure period due to short first flow period.

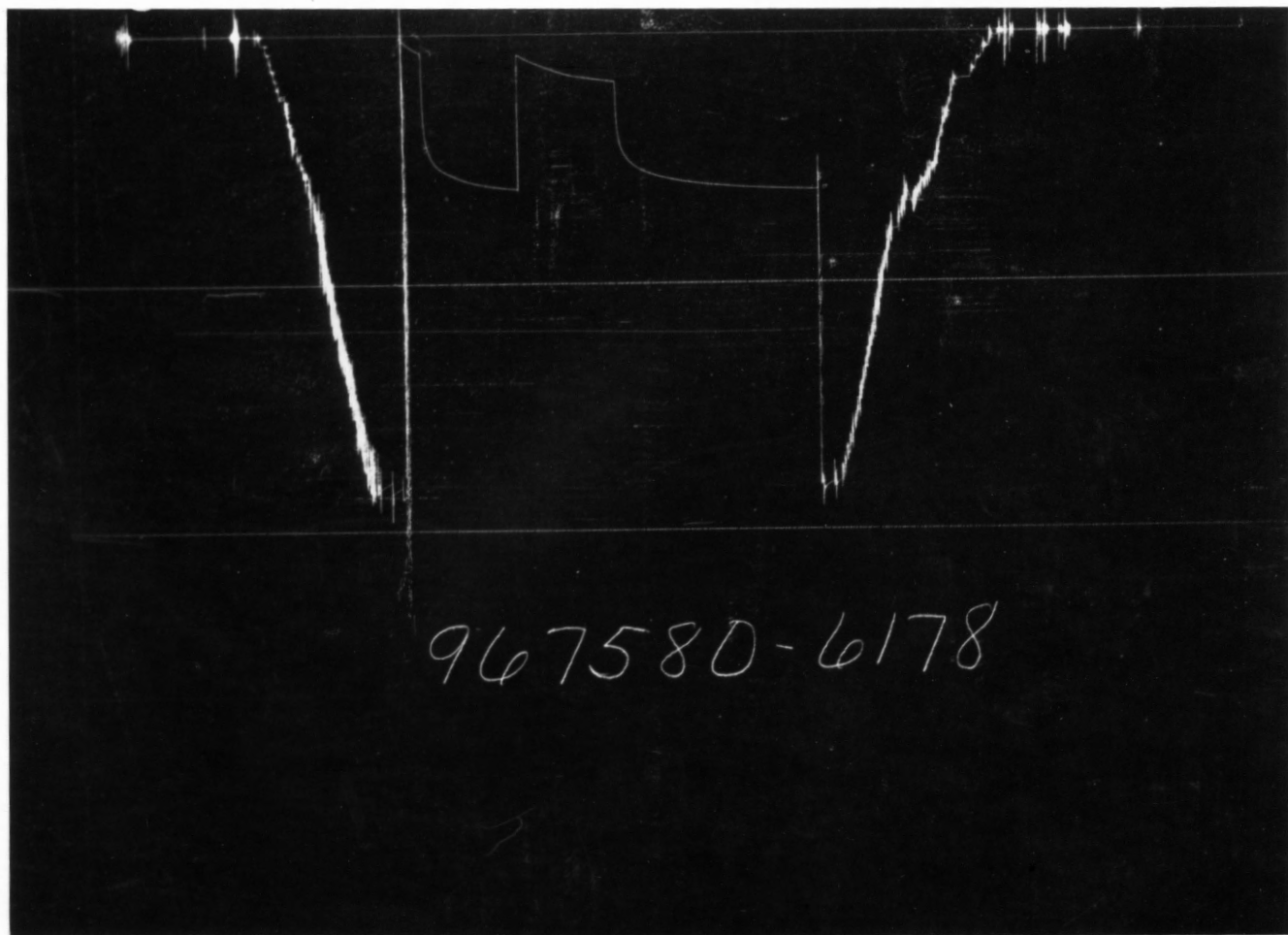
SUMMARY		B.T. Gauge No. 6178			B.T. Gauge No. 6177			
		Depth 3340			Depth 3390			
PRODUCT	EQUATION	FIRST	SECOND	THIRD	FIRST	SECOND	THIRD	UNITS
Production	$Q = \frac{1440 R}{t}$		62			63		bbls. day
Transmissibility	$\frac{Kh}{\mu} = \frac{162.6 Q}{m}$		66.222			66.966		$\frac{\text{md. ft.}}{\text{cp}}$
Indicated Flow Capacity	$Kh = \frac{Kh}{\mu} \mu$		1191.988			1205.395		md. ft.
Average Effective	$K = \frac{Kh}{h}$							md.
Permeability	$K_i = \frac{Kh}{h_i}$		59.599			60.270		md.
Damage Ratio	$DR = .183 \frac{P_s - P_f}{m}$		.560			.554		—
Theoretical Potential w/Damage Removed	$Q_1 = Q DR$		62			63		bbls. day
Approx. Radius of Investigation	$b \approx \sqrt{Kt}$ or $\sqrt{Kt_0}$							ft.
	$b_1 \approx \sqrt{K_1 t}$ or $\sqrt{K_1 t_0}$		65			65		ft.
Potentiometric Surface *	$\text{Pot.} = EI - GD + 2.319 P_s$		57			74		ft.

NOTICE: These calculations are based upon information furnished by you and taken from Drill Stem Test pressure charts, and are furnished you for your information. In furnishing such calculations and evaluations based thereon, Halliburton is merely expressing its opinion. You agree that Halliburton makes no warranty express or implied as to the accuracy of such calculations or opinions, and that Halliburton shall not be liable for any loss or damage, whether due to negligence or otherwise, in connection with such calculations and opinions.

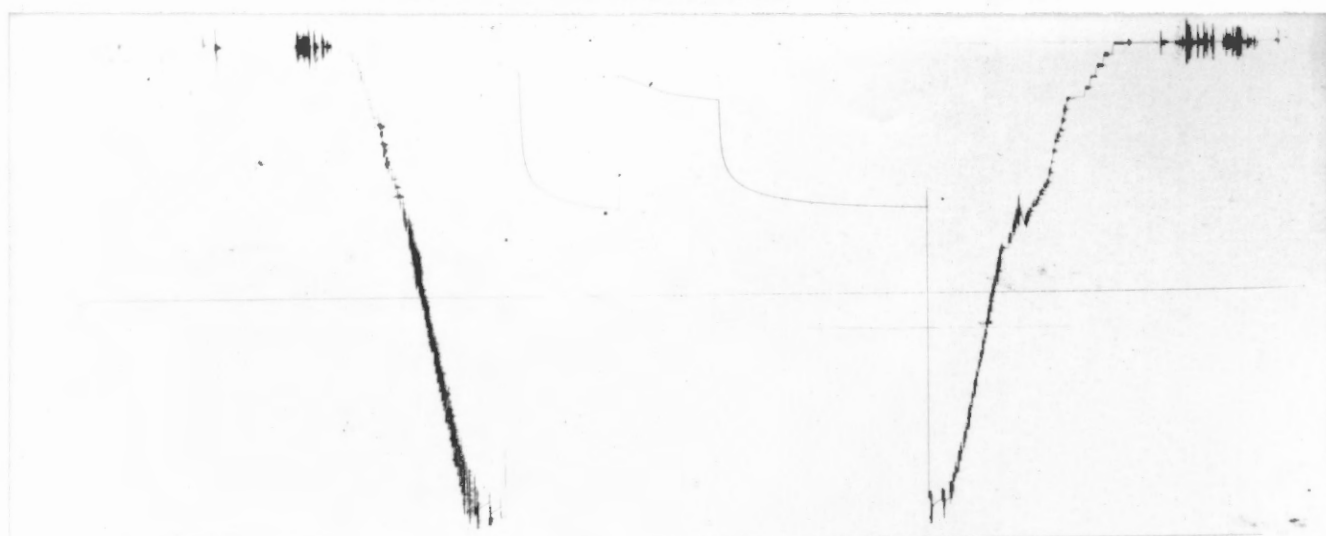


	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing				
Drill Collars	5.75"	2.75"	1'	3265'
Reversing Sub				
Water Cushion Valve	4 1/2"	3.826"	3010'	
Drill Pipe	4 1/2" WP	2.764"	318'	
Drill Collars				
Handling Sub & Choke Assembly	5"	.87"	6'	3328'
Dual CIP Valve				
Dual CIP Sampler	5"	.75"	5'	3338'
Hydro-Spring Tester				
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.06"	4'	3340'
Hydraulic Jar	5"	1.75"	5'	
VR Safety Joint	5"	1"	3'	
Pressure Equalizing Crossover				
Packer Assembly	8.75"	1.68"	6'	3355'
Distributor				
Packer Assembly	8.75"	1.68"	6'	3361'
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor	5"	3.84"	25'	
HT-500	5"	3.75"	1.5'	3388'
Blanked-Off B.T. Running Case	5"	2.44"	4'	3390'
Total Depth				3393'

PRESSURE



TIME



TEMPERATURE
RECORDER
CHART



10° each circle

OSWALD

Lease Name

A-17

6

3395' - 3475'

SOLAR PETROLEUM, INCORPORATED

Lease Owner/Company Name

Legal Location
Sec. - Twp. - Rng.

11 - 12S - 16W

Field Area

BLUEHILL

County

ELLIS

State

KANSAS

FLUID SAMPLE DATA				Date 10-17-80		Ticket Number 967581	
Sampler Pressure _____ P.S.I.G. at Surface				Kind of D.S.T. OPEN HOLE		Halliburton Location HAYS	
Recovery: Cu. Ft. Gas _____				Tester MR. BECKER		Witness MR. KNOBLE	
cc. Oil _____				MR. THOMPSON			
cc. Water _____				Drilling Contractor EMPHASIS DRILLING COMPANY #6 bc			
cc. Mud _____				EQUIPMENT & HOLE DATA			
Tot. Liquid cc. _____				Formation Tested Arbuckle			
Gravity _____ ° API @ _____ °F.				Elevation 1878' KE _____ Ft.			
Gas/Oil Ratio _____ cu. ft./bbl.				Net Productive Interval 25' _____ Ft.			
RESISTIVITY _____ CHLORIDE CONTENT _____				All Depths Measured From Kelly Bushing			
Recovery Water _____ @ _____ °F. _____ ppm				Total Depth 3475' _____ Ft.			
Recovery Mud _____ @ _____ °F. _____ ppm				Main Hole/Casing Size 9 7/8"			
Recovery Mud Filtrate _____ @ _____ °F. _____ ppm				Drill Collar Length 255' I.D. 2.764"			
Mud Pit Sample _____ @ _____ °F. _____ ppm				Drill Pipe Length 3107' I.D. 3.826"			
Mud Pit Sample Filtrate _____ @ _____ °F. _____ ppm				Packer Depth(s) 3389' - 3395' _____ Ft.			
Mud Weight 9.9 vis 61 sec.				Depth Tester Valve 3372' _____ Ft.			
TYPE		AMOUNT		Depth Back Surface		Bottom	
Cushion				Ft. Pres. Valve		Choke	
						.25" .75"	
Recovered 2400 Feet of Slightly muddy, gassey salt water							
Recovered _____ Feet of							
Recovered _____ Feet of							
Recovered _____ Feet of							
Recovered _____ Feet of							
Remarks No calculations available. Charts indicate possible partial plugging of anchor perforations during first flow period. Well equalized during final flow period. No production rates available upon which to base calculations.							
SEE PRODUCTION TEST DATA SHEET. Q = QUESTIONABLE.							
*Time given and time recorded does not agree.							
TEMPERATURE		Gauge No. 6178		Gauge No. 6177		Gauge No.	
		Depth: 3374' Ft.		Depth: 3472' Ft.		Depth: _____ Ft.	
		12 Hour Clock		12 Hour Clock		Hour Clock	
Est. _____ °F.		Blanked Off NO		Blanked Off YES		Blanked Off	
3470'						Tool	
Actual 100 °F.						Opened 1110	
		Pressures		Pressures		Opened Bypass 1520	
		Field Office		Field Office		Field Office	
		1846.2 1932 1907.5				Reported Computed	
		589.0 -Q 602 531.3				Minutes Minutes	
First Period		805.6 905 855.6				10 11	
		1119.9 1166 1168.4				60 58	
Second Period		764.1 821 832.6				60 59	
		1108.8 1156 1156.9				120 107*	
		1117.9 1156 1168.4					
Third Period							
Final Hydrostatic		1815.6 1911 1873.9					

Casing perms. _____ Bottom choke _____ Surf. temp. _____ °F Ticket No. _____
 Gas gravity _____ Oil gravity _____ GOR _____
 Spec. gravity _____ Chlorides _____ ppm Res. _____ @ _____ °F
 INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED _____

INDICATE TYPE AND SIZE OF GAS MEASURING DEVICE USED.

[illegible]

Gauge No.		6178		Depth		3374'		Clock No.		2820		12 hour		Ticket No.		967581			
First Flow Period		First Closed In Pressure				Second Flow Period				Second Closed In Pressure				Third Flow Period		Third Closed In Pressure			
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\text{Log } \frac{t + \theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\text{Log } \frac{t + \theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\text{Log } \frac{t + \theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\text{Log } \frac{t + \theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\text{Log } \frac{t + \theta}{\theta}$	PSIG Temp. Corr.			
0	.0000	589.0	.0000	805.6	.0000	.0000	764.1	.0000	.0000	1108.8									
1	.0069	P *	.0133	1086.6*	.0607	.0607	962.5**	.8090		1117.9									
2	.0207	P	.0400	1103.8	.1282	.1282	1062.5												
3	.0345	757.0	.0667	1109.8	.1956	.1956	1092.7												
4	.0484	823.8	.0934	1112.9	.2631	.2631	1101.8												
5	.0622	849.1	.1201	1114.9	.3305	.3305	1105.8												
6	.0760	805.6	.1468	1115.9	.3980	.3980	1108.8												
7			.1735	1116.9															
8	PLUGGING...		.2002	1117.9															
9			.2269	1117.9															
10			.2536	1118.9															
11			.2802	1118.9															
12			.3069	1118.9															
13			.3336	1118.9															
14			.3603	1119.9															
15			.3870	1119.9															

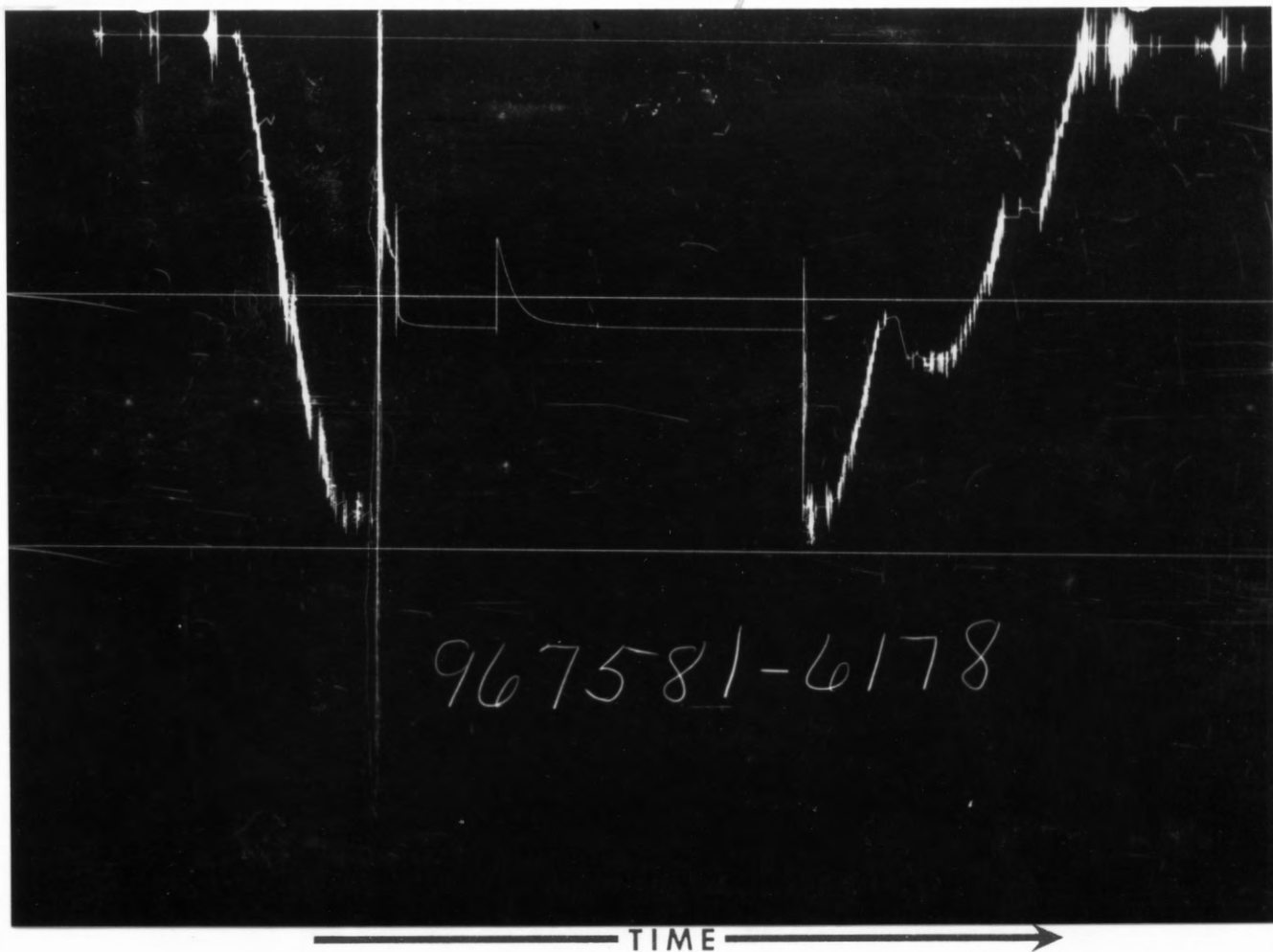
Gauge No.		6177		Depth		3472'		Clock No.		2800		12 hour	
First Flow Period		First Closed In Pressure				Second Flow Period				Second Closed In Pressure			
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	$\text{Log } \frac{t + \theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\text{Log } \frac{t + \theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\text{Log } \frac{t + \theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	$\text{Log } \frac{t + \theta}{\theta}$	PSIG Temp. Corr.
0	.0000	531.3	.0000	855.6	.0000	.0000	832.6	.0000	.0000	1156.9			
1	.0068	594.1*	.0133	1128.6*	.0599	.0599	1009.4**	.7190		1168.4			
2	.0205	785.5	.0399	1148.5	.1266	.1266	1106.6						
3	.0341	827.3	.0666	1156.9	.1932	.1932	1139.1						
4	.0477	875.5	.0932	1160.0	.2598	.2598	1149.5						
5	.0614	899.5	.1198	1162.1	.3264	.3264	1153.7						
6	.0750	855.6	.1464	1163.1	.3930	.3930	1156.9						
7			.1730	1164.1									
8			.1997	1165.1									
9			.2263	1166.3									
10			.2529	1167.3									
11			.2795	1167.3									
12			.3061	1167.3									
13			.3328	1168.4									
14			.3594	1168.4									
15			.3860	1168.4									

Reading Interval	2	4	10	Minutes
REMARKS:	*Interval = 1 minute **Interval = 2 minutes ***Interval = 9 minutes P = Plugging			



	O. D.	I. D.	LENGTH	DEPTH
Drill Pipe or Tubing				
Drill Collars				
Reversing Sub	5.75"	2.75"	1'	3299'
Water Cushion Valve				
Drill Pipe	4½"	3.826"	3107'	
Drill Collars	4½" WP	2.764"	255'	
Handling Sub & Choke Assembly				
Dual CIP Valve	5"	.87"	6'	3362'
Dual CIP Sampler				
Hydro-Spring Tester	5"	.75"	5'	3372'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.06"	4'	3374'
Hydraulic Jar	5"	1.75"	5'	
VR Safety Joint	5"	1"	3'	
Pressure Equalizing Crossover				
Packer Assembly	8.75"	1.68"	6'	3389'
Distributor				
Packer Assembly	8.75"	1.68"	6'	3395'
Flush Joint Anchor				
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case				
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Distributor				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor	4½" WP	2.764"	63'	
Drill Collars				
Flush Joint Anchor	5"	3.84"	10'	
HT-500	5"	3.75"	1.5'	3470'
Blanked-Off B.T. Running Case	5"	2.44"	4'	3472'
Total Depth				3475'

↓ PRESSURE



Each Horizontal Line Equal to 1000 p.s.i.

TEMPERATURE RECORDER CHART



10° each circle

	MCF/D
OF_3	= Theoretical Open Flow Potential with/Damage Removed Max. MCF/D
OF_4	= Theoretical Open Flow Potential with/Damage Removed Min. MCF/D
P_s	= Extrapolated Static Pressure Psig.
P_f	= Final Flow Pressure Psig.
P_{ot}	= Potentiometric Surface (Fresh Water *) Feet
Q	= Average Adjusted Production Rate During Test bbls/day
Q_1	= Theoretical Production w/Damage Removed bbls/day
Q_g	= Measured Gas Production Rate MCF/D
R	= Corrected Recovery bbls
r_w	= Radius of Well Bore Feet
t	= Flow Time Minutes
t_o	= Total Flow Time Minutes
T	= Temperature Rankine °R
Z	= Compressibility Factor —
μ	= Viscosity Gas or Liquid CP
Log	= Common Log

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given,
Fresh Water Corrected to 100° F.