FLUID SAMPLER DATA

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.

	RESISTIVITY			CHLORIDE CONTENT
Recovery Water	_____	@ _____	°F.	_____ ppm
Recovery Mud	_____	@ _____	°F.	
Recovery Mud Filtrate	_____	@ _____	°F.	_____ ppm
Mud Pit Sample	_____	@ _____	°F.	
Mud Pit Sample Filtrate	_____	@ _____	°F.	_____ ppm
Mud Weight	9.8	vis 34		cp

Date 10-26-69 Ticket Number 128298
Kind of Job OPEN HOLE Halliburton District PRATT
Tester BILL THOMPSON Witness BOB MC CAN
Drilling Contractor BOWERS DRILLING COMPANY SM S

EQUIPMENT & HOLE DATA

Formation Tested Douglas
Elevation - Ft.
Net Productive Interval 12' Ft.
All Depths Measured From Kelly bushing
Total Depth 3699' Ft.
Main Hole/Casing Size 7 7/8"
Drill Collar Length 120 I.D. _____
Drill Pipe Length 3400 I.D. 3.826"
Packer Depth(s) 3687-3682' Ft.
Depth Tester Valve 3662' Ft.

Cushion TYPE AMOUNT _____ Ft. Depth Back Pres. Valve _____ Surface Choke 1" Bottom Choke 3/4"

Recovered 72 Feet of watery mud
Recovered 122 Feet of muddy water
Recovered 120 Feet of water
Recovered _____ Feet of _____
Recovered _____ Feet of _____

Meas. From Tester Valve

Remarks Tool opened for a 10 minute first flow. Closed for a 30 minute first closed in pressure. Tool reopened for a 60 minute second flow..... gas to the surface in 10 minutes.. measured 196,000 MCF....would not gauge after 7 minutes. Closed for a 30 minute second closed in pressure.

TEMPERATURE	Gauge No. 1717	Gauge No. 1715	Gauge No.	TIME
	Depth: 3672 Ft.	Depth: 3695 Ft.	Depth: Ft.	
	12 Hour Clock	12 Hour Clock	Hour Clock	Tool Opened 6:10 A.M. P.M.
Est. °F.	Blanked Off no	Blanked Off yes	Blanked Off	
3693' @ Actual 106 °F.	Pressures	Pressures	Pressures	Tool Closed 8:20 A.M. P.M.

	Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic	1970	1962	1970	1973				
First Period Flow Initial	26	25	26	41			—	—
First Period Flow Final	51	48	51	53			10	10
First Period Closed in	1216	1214	1216	1215			30	30
Second Period Flow Initial	51	56	51	75			—	—
Second Period Flow Final	144	149	144	155			60	60
Second Period Closed in	1131	1133	1131	1133			30	30
Third Period Flow Initial	-	-	-	-			—	—
Third Period Flow Final	-	-	-	-				
Third Period Closed in	-	-	-	-				
Final Hydrostatic	1953	1953	1953	1963			—	—

Legal Location Sec. - Twp. - Rng. 20 31 11
Lease Name WATKINS
Well No. 1-A
Test No. 1
Tested Interval 3687-3699'
Field Area WILDCAT
County PRATT
State KANSAS
Lease Owner/Company Name BOWERS DRILLING COMPANY

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FORMATION TEST DATA

LITTLE'S 83429 15M 4/69—33, 34-13

5

Gauge No. 1717	Depth 3672'	Clock No. ??	12 hour	Ticket No. 128298

	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"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.
0	.000	25	.000		48	.000	56	.000		149					
1	.013	27	.020		576	.065	70	.0204		718					
2	.026	34	.040		847	.130	93	.0408		869					
3	.039	39	.060		996	.195	110	.0612		950					
4	.052	44	.080		1087	.260	125	.0816		1002					
5	.065	48	.100		1142	.325	137	.1020		1039					
6			.120		1172	.390	149	.1224		1068					
7			.140		1191			.1428		1089					
8			.160		1202			.1632		1107					
9			.180		1209			.1836		1121					
10			.200		1214			.2040		1133					
11															
12															
13															
14															
15															

Gauge No. 1715	Depth 3695'	Clock No. ??	12 hour

0	.000	41	.000		53	.000	75	.000		155					
1	.0136	32	.0203		611	.0677	74	.0208		724					
2	.0272	38	.0406		858	.1354	96	.0416		870					
3	.0408	42	.0609		1001	.2031	115	.0624		951					
4	.0544	48	.0812		1090	.2708	129	.0832		1006					
5	.0680	53	.1015		1143	.3385	143	.1040		1041					
6			.1218		1173	.4070	155	.1248		1067					
7			.1421		1192			.1456		1090					
8			.1624		1203			.1664		1108					
9			.1827		1210			.1872		1121					
10			.2030		1215			.2080		1133					
11															
12															
13															
14															
15															
Reading Interval	2		3			10		3							Minutes

REMARKS:

5

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SPECIAL PRESSURE DATA

LITTLE'S 83426 10M 4/69—13, 14-13

128298

	O. D.	I. D.	LENGTH	DEPTH
Reversing Sub	5 5/8"	2"	1½'	
Water Cushion Valve				
Drill Pipe	4½" FH	3.826	3400'	
Drill Collars	6"	2¼"	120'	
Handling Sub & Choke Assembly	5 3/4"	2¼"		
Dual CIP Valve	5"	3/4"	5'	
Dual CIP Sampler				
Hydro-Spring Tester	5"	3/4"	5'	3632'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	2¼"	4'	3672'
Hydraulic Jar	5"	3/4	4'	
VR Safety Joint	5"	1½"	2½"	
Pressure Equalizing Crossover				
Packer Assembly	6 3/4"	1.5"	4'	3687'
Distributor				
Packer Assembly				
Flush Joint Anchor	5"	2¼"	12'	
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case	5"	2 1/4	4'	3695'
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor				
Blanked-Off B.T. Running Case				

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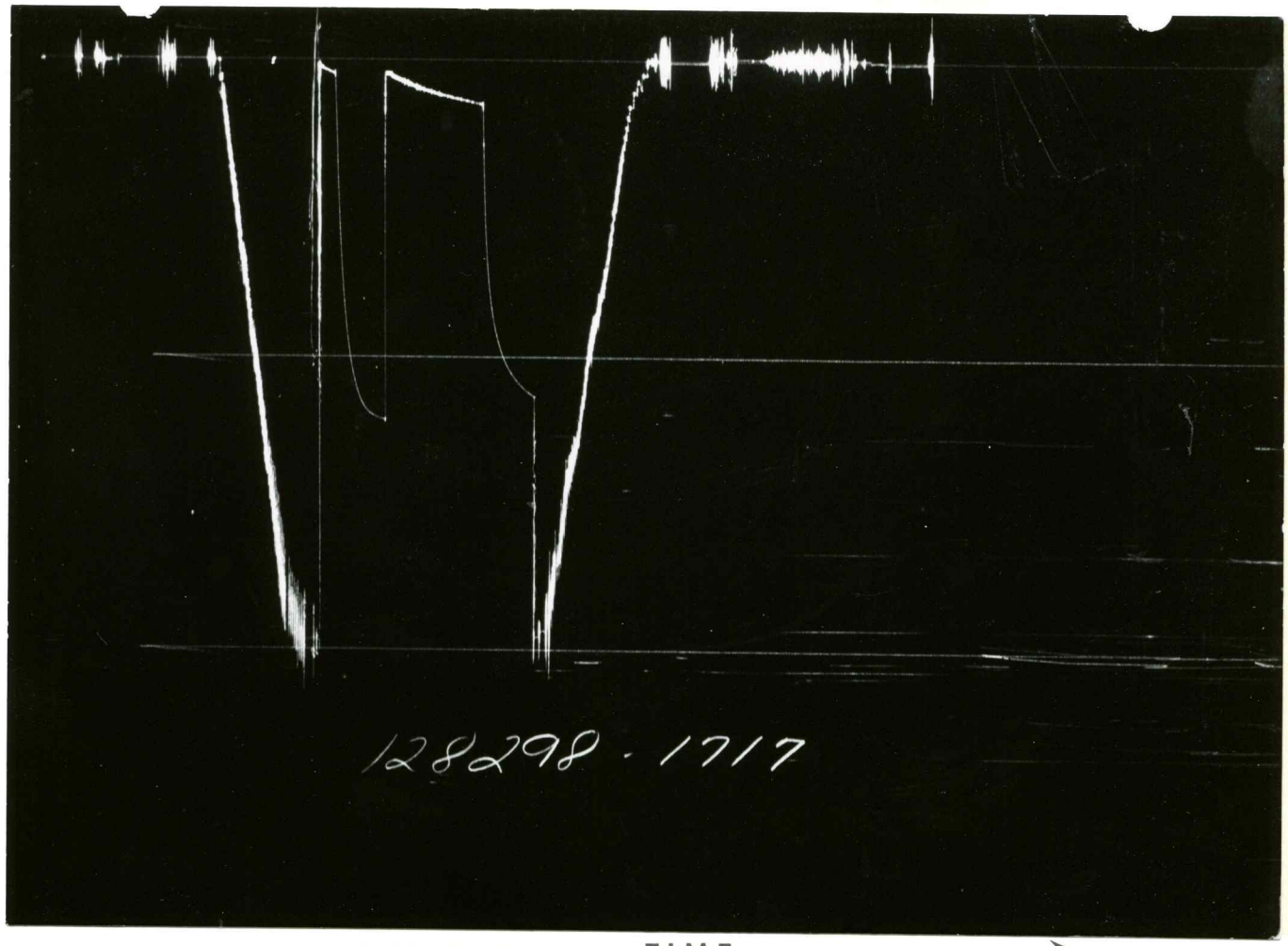
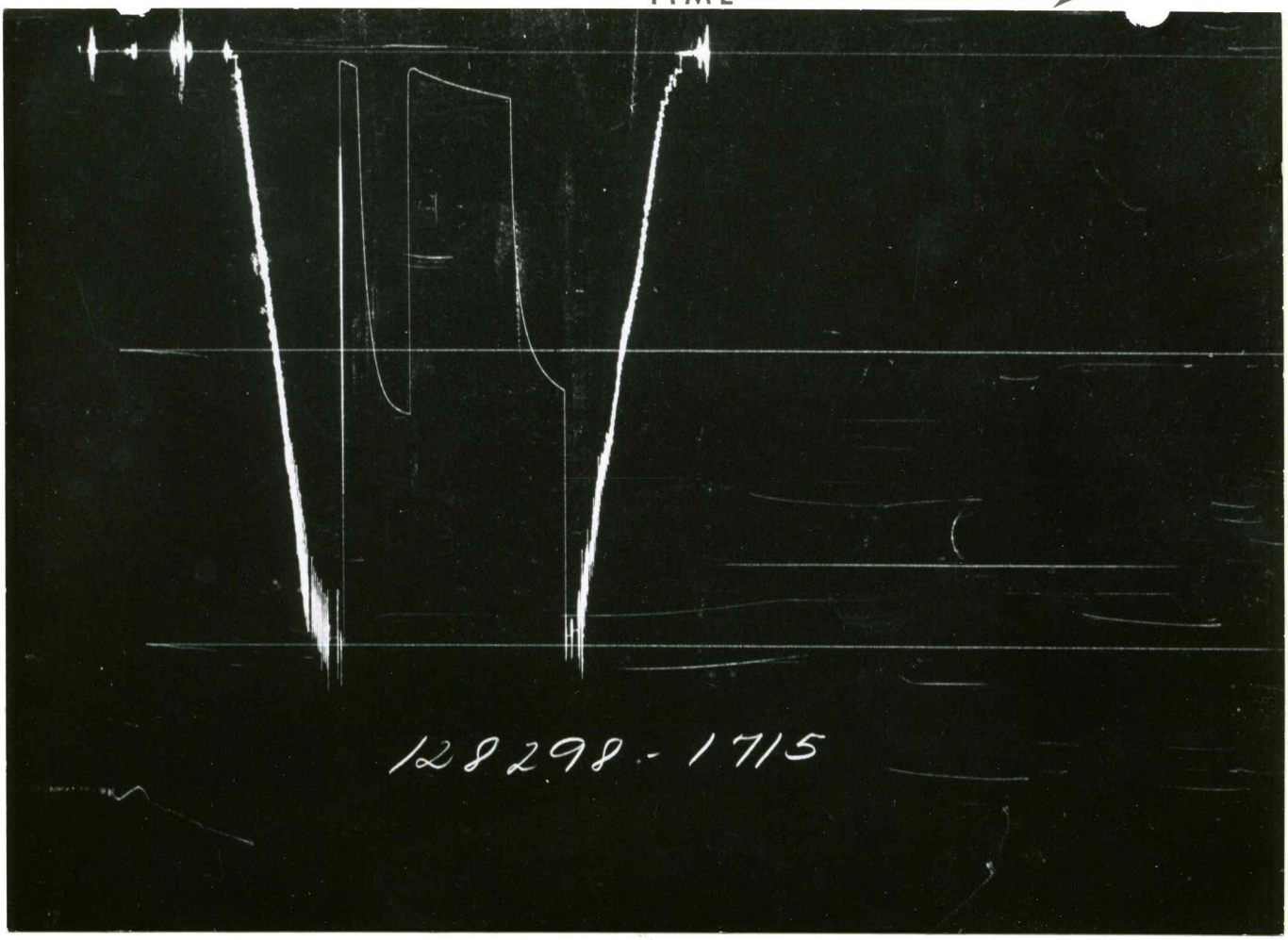
EQUIPMENT DATA

LITTLE'S 83431 15M 4/69—15, 16-13

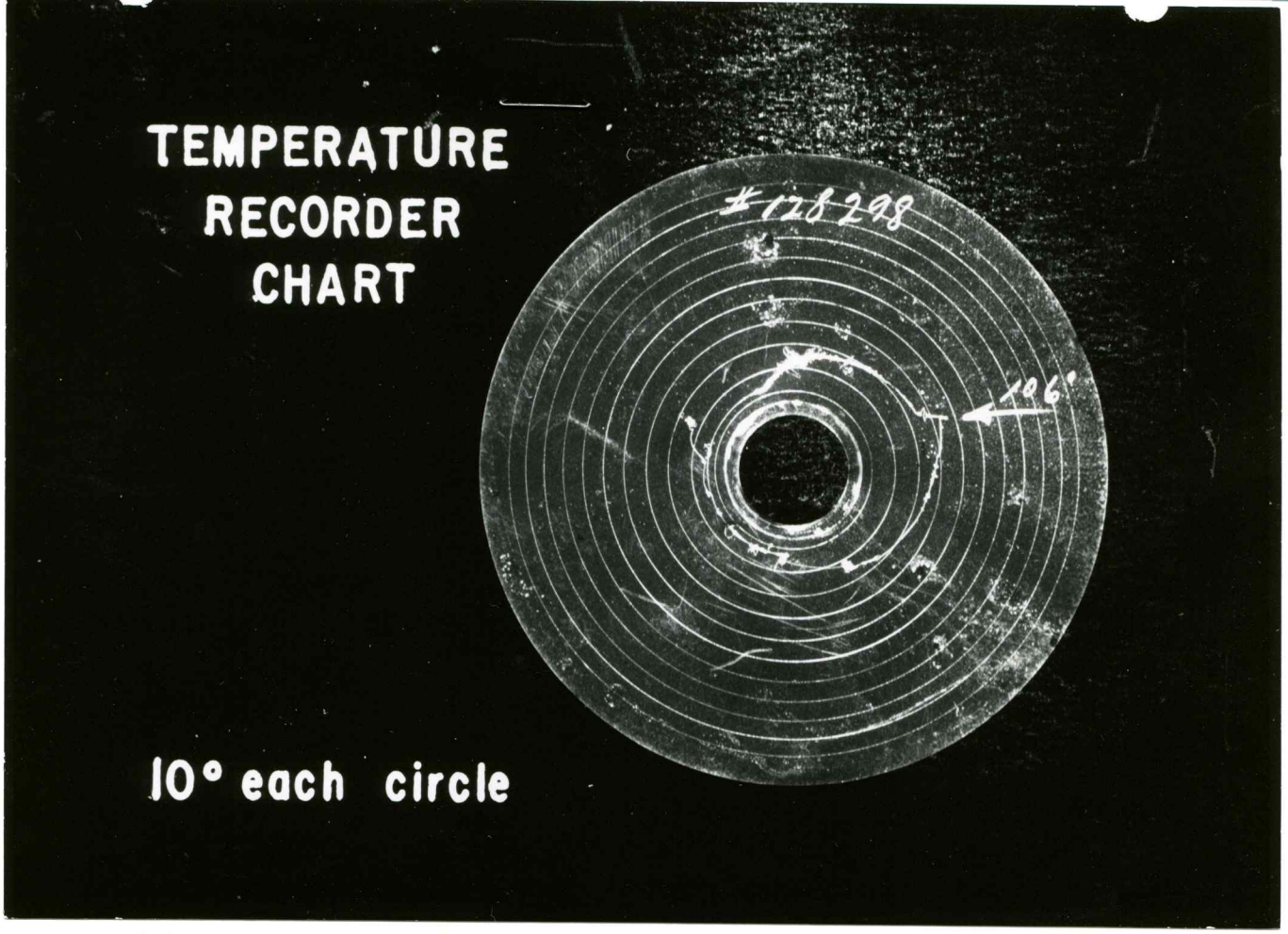


PRESSURE

TIME



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



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 SAMPLER DATA

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.

		RESISTIVITY		CHLORIDE CONTENT
Recovery Water	_____ @ _____	°F.	_____	ppm
Recovery Mud	_____ @ _____	°F.		
Recovery Mud Filtrate	_____ @ _____	°F.	_____	ppm
Mud Pit Sample	_____ @ _____	°F.		
Mud Pit Sample Filtrate	_____ @ _____	°F.	_____	ppm
Mud Weight	10	vis 36		cp

Date	10-29-69
Ticket Number	023158 -A
Kind of Job	OPEN HOLE
Halliburton District	GREAT BEND
Tester	GARDLEY
Witness	MC CANN
Drilling Contractor	BOWERS DRILLING COMPANY NM

EQUIPMENT & HOLE DATA

Formation Tested	Mississippian
Elevation	1649' D.F. Ft.
Net Productive Interval	21' Ft.
All Depths Measured From	Kelly Bushing
Total Depth	4401' Ft.
Main Hole/Casing Size	7 7/8"
Drill Collar Length	109' I.D. 2 3/8"
Drill Pipe Length	4239' I.D. 2.826"
Packer Depth(s)	4363' - 4358' Ft.
Depth Tester Valve	4340' Ft.

Cushion TYPE NONE AMOUNT _____ Ft. Depth Back Pres. Valve NONE Surface Choke 1" Bottom Choke 3/4"

Recovered 30' Feet of slightly oil cut thin drilling mud

Recovered _____ Feet of

Recovered _____ Feet of

Recovered _____ Feet of

Recovered _____ Feet of

Meas. From Tester Valve

Remarks Tool opened @ 7:12 with a good blow - which increased to a strong blow in 2 minutes. Rotated tool for a 30 minute first closed in pressure. Tool reopened with a good blow - which decreased to a weak blow throughout the test. Took a 30 minute second closed in pressure. Off bottom @ 9:22.

TEMPERATURE	Gauge No. 684 Depth: 4345' Ft.	Gauge No. 528 Depth: 4397' Ft.	Gauge No. Depth: Ft.	TIME
	12 Hour Clock	12 Hour Clock	Hour Clock	Tool Opened 7:12 A.M.
Est. °F.	Blanked Off NO	Blanked Off YES	Blanked Off	Tool Closed 8:22 A.M.
4396' @ Actual 110° °F.	Pressures	Pressures	Pressures	

		Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic		-	2386	2348	2392				
First Period	Flow Initial	-	29	42	61			___	___
	Flow Final	-	29	46	43			10	
	Closed in	-	177	171	187			30	
Second Period	Flow Initial	-	18	46	49			___	___
	Flow Final	-	34	51	56			60	
	Closed in	-	252	265	273			30	
Third Period	Flow Initial							___	___
	Flow Final								
	Closed in								
Final Hydrostatic		-	2343	2348	2367			___	___

Legal Location Sec. - Twp. - Rng. 20 - 13 - 11

Lease Name WATKINS A

Well No. 1

Test No. 2

Tested Interval 4363' - 4401'

Field Area WILDCAT

County BARBER

State KANSAS

Lease Owner/Company Name BOWERS DRILLING COMPANY, INC.

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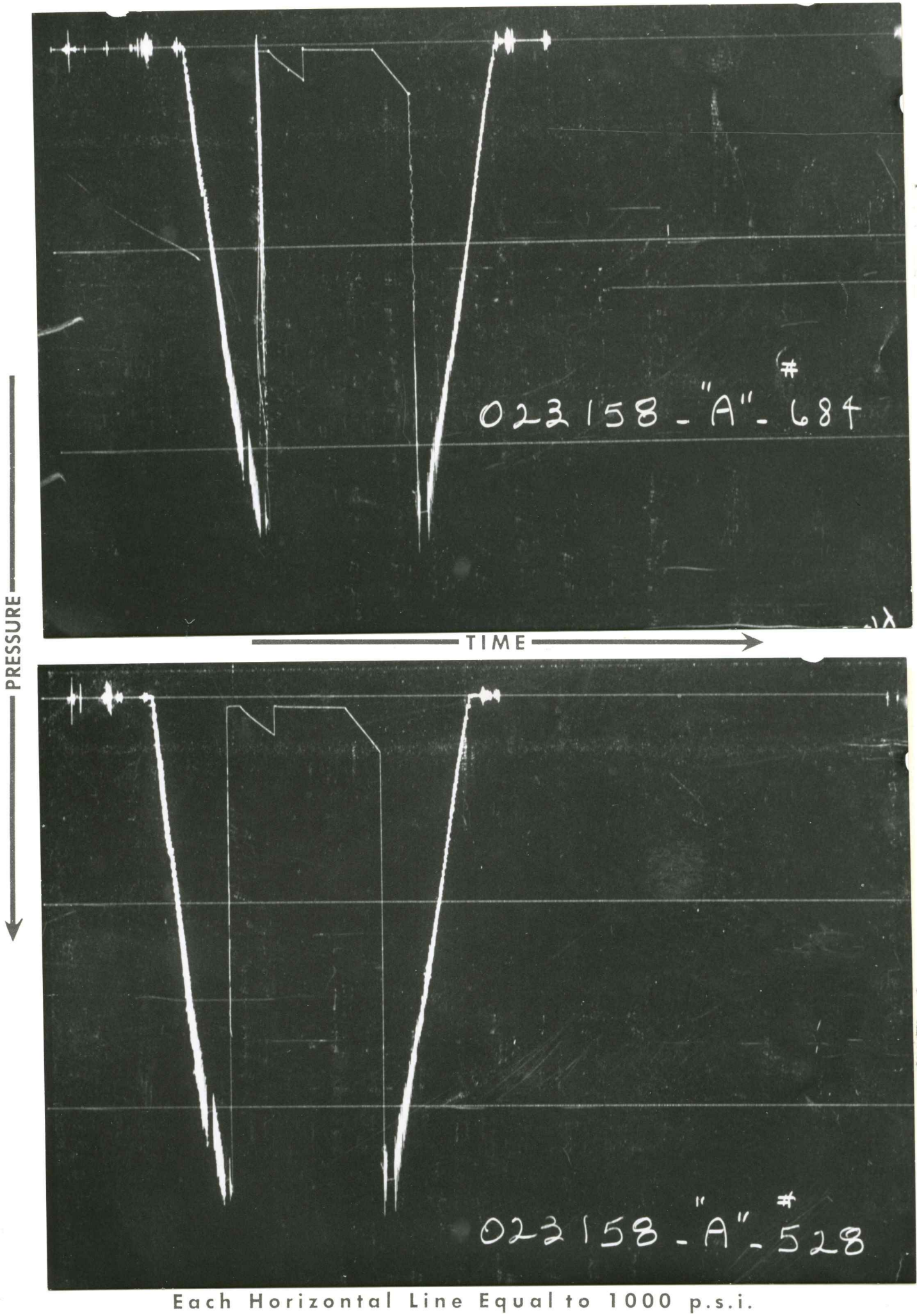
FORMATION TEST DATA

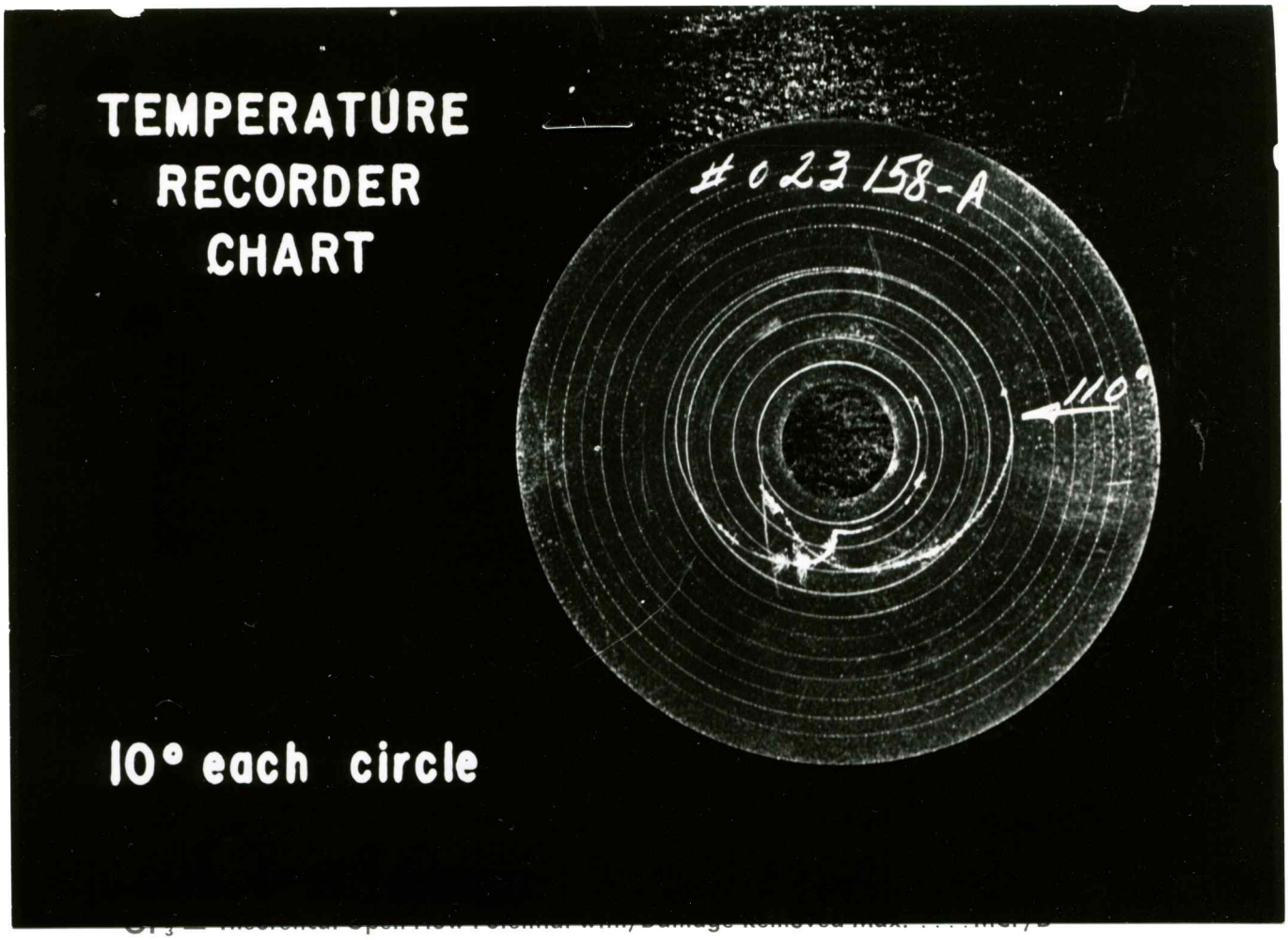
LITTLE'S 83429 15M 4/69—33, 34-13

5

	O. D.	I. D.	LENGTH	DEPTH
Reversing Sub	5.75"	2.75"	12"	
Water Cushion Valve				
Drill Pipe	4.50"	2.826"	239'	
Drill Collars	6"	2 3/8"	109'	
Handling Sub & Choke Assembly				
Dual CIP Valve	5"	.87"	48.92"	
Dual CIP Sampler				
Hydro-Spring Tester	5"	.75"	60.21"	4340'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.06"	49.63"	4345'
Hydraulic Jar	5"	.87"	39.46"	
VR Safety Joint	5"	1"	33.40"	
Pressure Equalizing Crossover				
Packer Assembly	6 3/4"	1.53"	48.89"	4358'
Distributor				
Packer Assembly	6 3/4"	1.53"	48.89"	4363'
Flush Joint Anchor	5"	2.37"	38'	
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case	5"	3.06"	49.63"	4397'
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor				
Blanked-Off B.T. Running Case				



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



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 SAMPLER DATA

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.

		RESISTIVITY	CHLORIDE CONTENT
Recovery Water	@ °F.		ppm
Recovery Mud	@ °F.		
Recovery Mud Filtrate	@ °F.		ppm
Mud Pit Sample	@ °F.		
Mud Pit Sample Filtrate	@ °F.		ppm
Mud Weight	10	vis 38	cp

Date 10-30-69 Ticket Number 023158 - B
Kind of Job OPEN HOLE Halliburton District GREAT BEND
Tester GARDLEY Witness MC CANN
Drilling Contractor BOWERS DRILLING CO.,INC. NM

EQUIPMENT & HOLE DATA

Formation Tested	Mississippian	
Elevation	1649' D.F.	Ft.
Net Productive Interval	4396' - 4436'	Ft.
All Depths Measured From	Kelly Bushing	
Total Depth	4436'	Ft.
Main Hole/Casing Size	7 7/8"	
Drill Collar Length	109' I.D.	2 3/8"
Drill Pipe Length	4268' I.D.	2.826"
Packer Depth(s)	4396' - 4391'	Ft.
Depth Tester Valve	4373'	Ft.

Cushion TYPE NONE AMOUNT Ft. Depth Back Pres. Valve NONE Surface Choke 1" Bottom Choke 3/4"

Recovered Feet of
Recovered Feet of
Recovered Feet of
Recovered Feet of
Recovered Feet of

Meas. From Tester Valve

Remarks Tool opened @ 6:52 with a good blow for a 10 minute first flow. Rotated tool for a 30 minute first closed in pressure. Tool reopened @ 7:32 with a good blow - dead in 45 minutes. Tool closed for a 30 minute second closed in pressure. Off bottom @ 9:02.

TEMPERATURE	Gauge No. 684		Gauge No. 528		Gauge No.		TIME	
	Depth: 4378' Ft.		Depth: 4432' Ft.		Depth: Ft.			
Est. 113 °F.	12 Hour Clock		12 Hour Clock		Hour Clock		Tool Opened	A.M. 6:52 P.M.
	Blanked Off NO		Blanked Off YES		Blanked Off		Tool Closed	A.M. 9:02 P.M.
Actual °F.	Pressures		Pressures		Pressures			
	Field	Office	Field	Office	Field	Office	Reported Minutes	Computed Minutes
Initial Hydrostatic	2329	2431	2365	2408				
First Period Flow Initial	12	22	42	67			___	___
First Period Flow Final	17	26	51	50			10	
First Period Closed in	236	248	265	268			30	
Second Period Flow Initial	17	32	51	63			___	___
Second Period Flow Final	35	42	60	65			60	
Second Period Closed in	157	168	188	190			30	
Third Period Flow Initial							___	___
Third Period Flow Final								
Third Period Closed in								
Final Hydrostatic	2329	2351	2365	2377			___	___

Legal Location Sec. - Twp. - Rng. 20 - 13 - 11
Lease Name WATKINS
Well No. 1
Test No. 3
Field Area WILDCAT
County BARBER
State KANSAS
Tested Interval 4396' - 4436'
Lease Owner/Company Name BOWERS DRILLING CO., INC.

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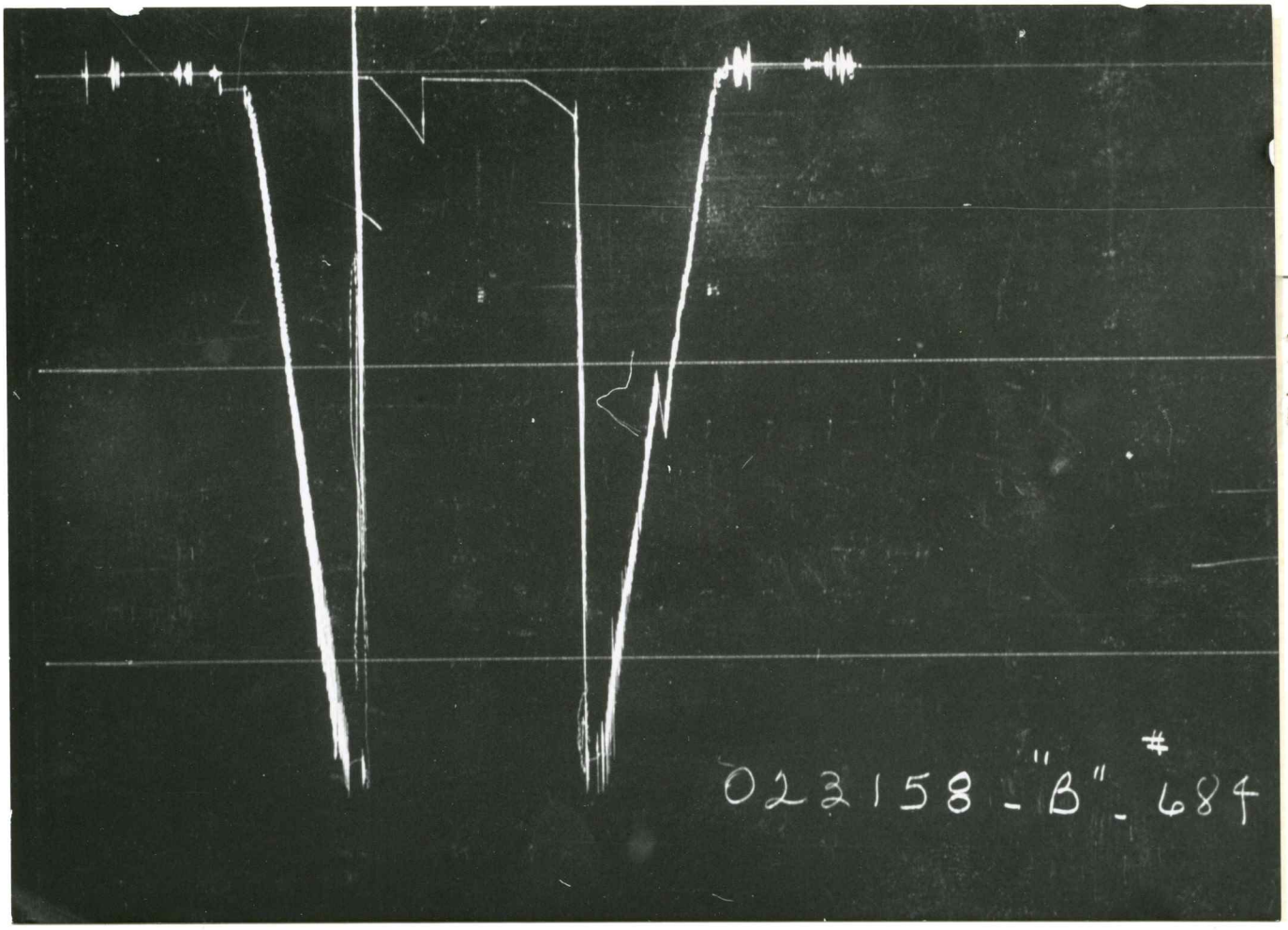
FORMATION TEST DATA

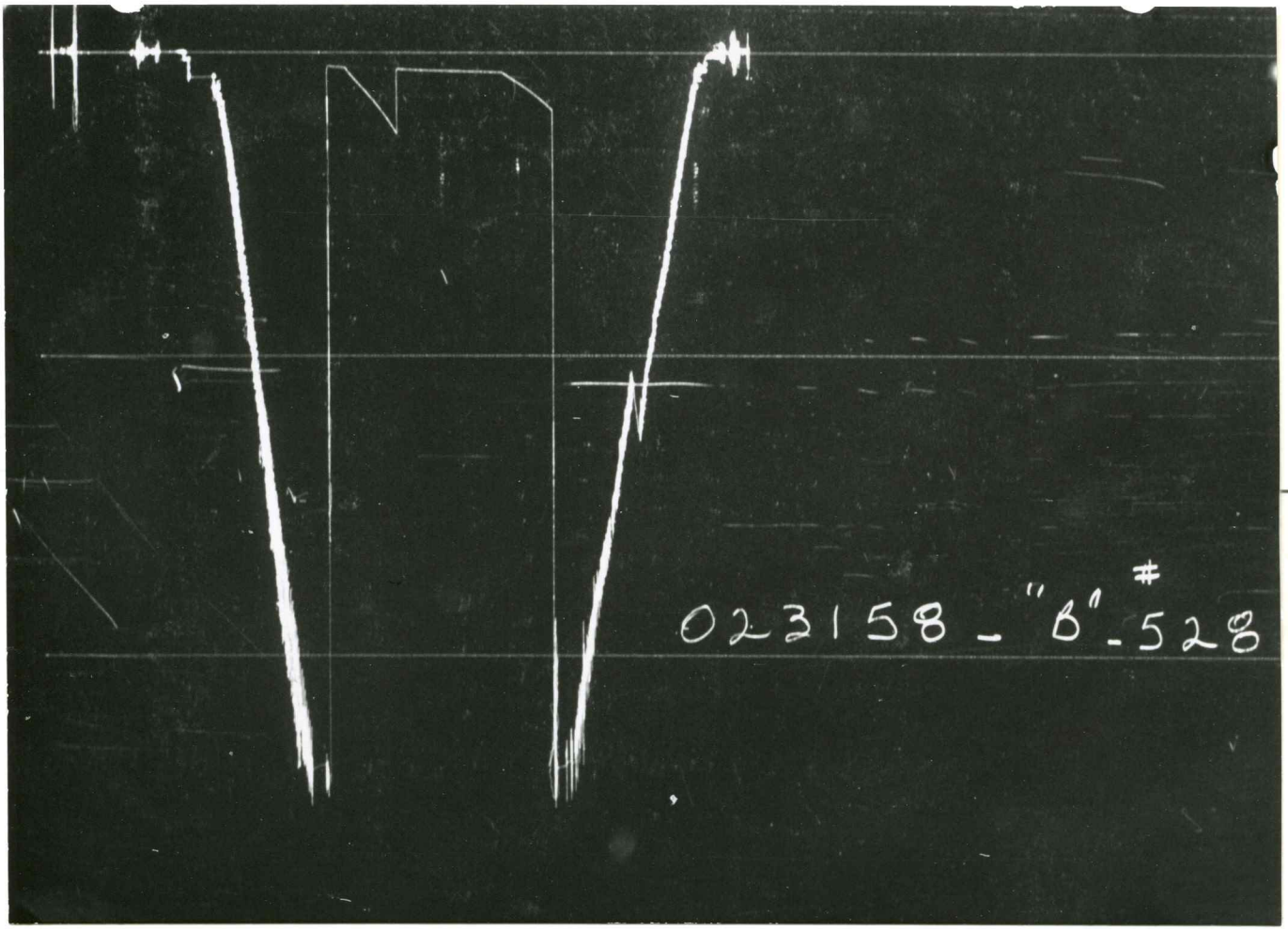
LITTLE'S 83429 15M 4/69—33, 34-13

	O. D.	I. D.	LENGTH	DEPTH
Reversing Sub	5.75"	2.75"	12"	
Water Cushion Valve				
Drill Pipe	4.50"	2.826"	4268'	
Drill Collars	6"	2 3/8"	109'	
Handling Sub & Choke Assembly				
Dual CIP Valve	5"	.87"	48.92"	
Dual CIP Sampler				
Hydro-Spring Tester	5"	.75"	60.21"	4373'
Multiple CIP Sampler				
Extension Joint				
AP Running Case	5"	3.06"	49.63"	4378'
Hydraulic Jar	5"	.87"	39.46"	
VR Safety Joint	5"	1"	33.40"	
Pressure Equalizing Crossover				
Packer Assembly	6 3/4"	1.53"	48.89"	4391'
Distributor				
Packer Assembly	6 3/4"	1.53"	48.89"	4396'
Flush Joint Anchor	5"	2.37"	40'	
Pressure Equalizing Tube				
Blanked-Off B.T. Running Case	5"	3.06"	49.63"	4432'
Drill Collars				
Anchor Pipe Safety Joint				
Packer Assembly				
Packer Assembly				
Anchor Pipe Safety Joint				
Side Wall Anchor				
Drill Collars				
Flush Joint Anchor				
Blanked-Off B.T. Running Case				

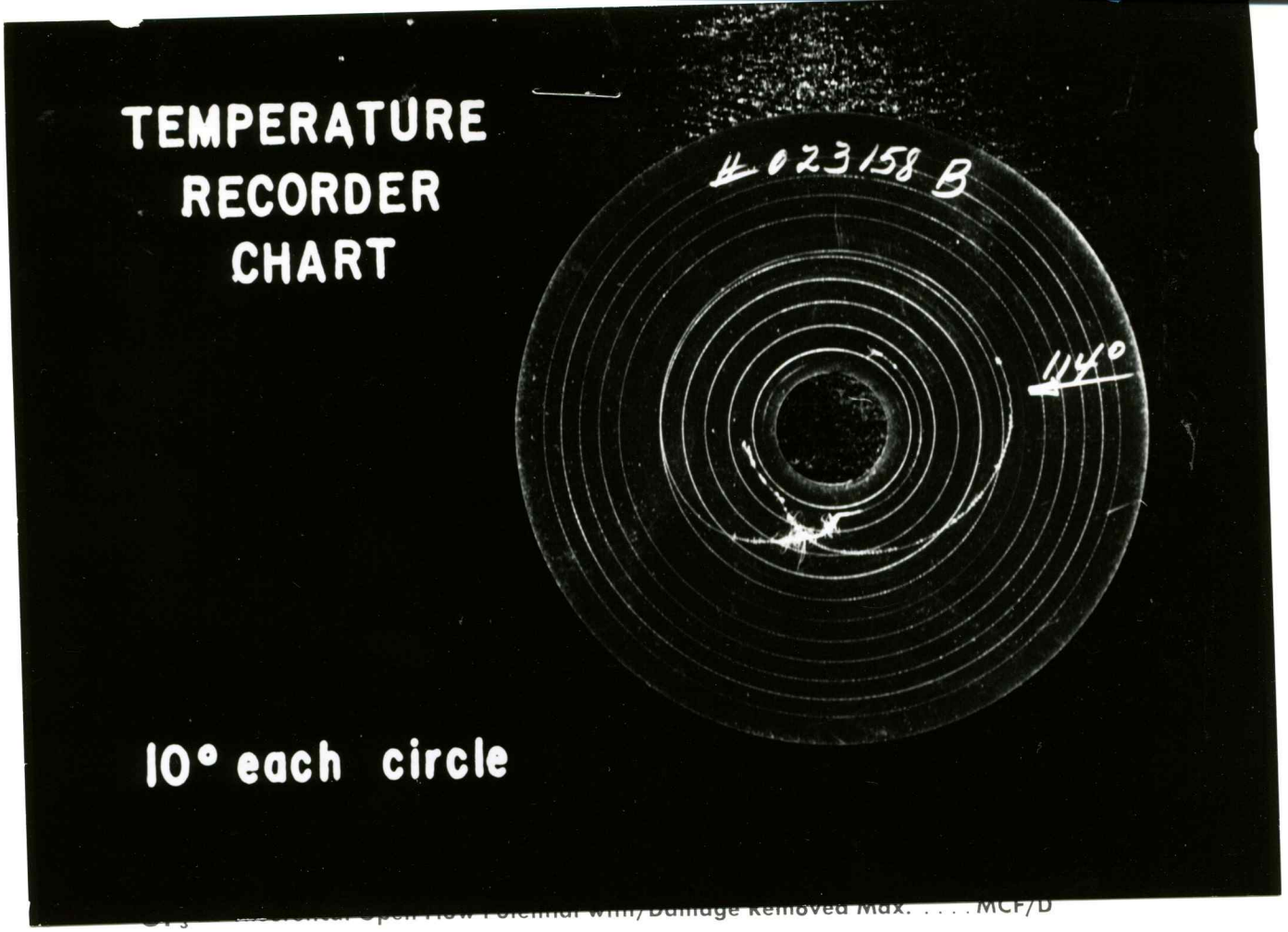


PRESSURE

TIME



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



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.