

Flow Time	1st 11	Min.	2nd 60	Min.	Date	12-15-62	Ticket Number	347736 S	Legal Location Sec. - Twp. - King.	Lease Name	Well No.	Test No.	Field Area	County	State	OWNER'S DISTRICT
Closed In Press. Time	1st 45	Min.	2nd 45	Min.	Kind of Job	OPEN HOLE	Halliburton District	LIBERAL								
Pressure Readings	Field			Office Corrected		Tester	R. WHITE	Witness	R. ROBEE	29-33-30	SOUTH PLAINS	MEADE	HEIMERICH AND PAYNE INCORPORATED			
Depth Top Gauge	5704	Ft.	NO	Blanked Off	Drilling Contractor	COMPANY TOOLS										
BT. P.R.D. No.	1605		12	Hour Clock	Elevation	2718'	Top Packer	5712'	Lease Owner/Company Name							
Initial Hydro Mud Pressure	2875		2804		Total Depth	5795	Bottom Packer	5750								
Initial Closed in Pres.	1535		1523		Interval Tested	5750-5795'	Formation Tested	MARROW	HEIMERICH AND PAYNE INCORPORATED							
Initial Flow Pres.	55	1	73		Casing or Hole Size	7 7/8"	Casing Perfs. } Top									
Final Flow Pres.	65	2	59		Surface Choke	1"	Bottom Choke	3/4"	HEIMERICH AND PAYNE INCORPORATED							
Final Closed in Pres.	1220		1211		Size & Kind Drill Pipe	4 1/2" EX. HOLE	Drill Collars Above Tester	2 1/4" x 460'								
Final Hydro Mud Pressure	2810		2803		Mud Weight	9.3	Mud Viscosity	57	HEIMERICH AND PAYNE INCORPORATED							
Depth Cen. Gauge	5791	Ft.	YES	Blanked Off	Temperature	130	Anchor Size & Length	ID 3 3/4" X 458								
BT. P.R.D. No.	1606		12	Hour Clock	Depths Mea. From	DERRICK FLOOR	Depth of Tester Valve	5695 Ft.	HEIMERICH AND PAYNE INCORPORATED							
Initial Hydro Mud Pres.	2890		2814		TYPE	AMOUNT	Depth Back Pres. Valve	5690 Ft.								
Initial Closed in Pres.	1545		1526		Cushion	None	Recovered	100 Feet of Drilling mud	HEIMERICH AND PAYNE INCORPORATED							
Initial Flow Pres.	110	1	133				Recovered	Feet of								
Final Flow Pres.	70	2	74				Recovered	Feet of	HEIMERICH AND PAYNE INCORPORATED							
Final Closed in Pres.	1215		1211				Recovered	Feet of								
Final Hydro Mud Pres.	2820		2813		Oil A.P.I. Gravity	-	Water Spec. Gravity	-	HEIMERICH AND PAYNE INCORPORATED							
Depth Bot. Gauge		Ft.		Blanked Off	Gas Gravity	-	Surface Pressure	- psi								
BT. P.R.D. No.				Hour Clock	Tool Opened	2:25	Tool Closed	5:01	HEIMERICH AND PAYNE INCORPORATED							
Initial Hydro Mud Pres.					Remarks	Opened tool for an 11 minute flow. Closed										
Initial Closed in Pres.						in for a 2:36 PM for a 45 minute Initial Closed			HEIMERICH AND PAYNE INCORPORATED							
Initial Flow Pres.		1				in Pressure. Reopened tool with a good blow. Gas										
Final Flow Pres.		2				to surface at 3:25 PM (too weak to gauge throughout			HEIMERICH AND PAYNE INCORPORATED							
Final Closed in Pres.		1				test). Closed in for a 45 minute Final Closed in										
Final Hydro Mud Pres.		2				Pressure. Calculation not applicable - insufficient closures on build-up curves. No gas rate.										

FORMATION TEST DATA

5

Gauge No. 1605		Depth 5791			Clock 12 hour		Ticket No. 347736		
First Flow Period		Initial Closed In Pressure			Second Flow Period		Final Closed In Pressure		
Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{e}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{e}$	PSIG Temp. Corr.
P ₀	.000 73	.000		63	.000	59	.000		67
P ₁	.0152 51	.0303		381	.384	67	.0295		277
P ₂	.0304 54	.0606		638			.0590		464
P ₃	.0456 54	.0909		850			.0885		618
P ₄	.0608 65	.1212		1035			.1180		761
P ₅	.0760 63	.1515		1188			.1475		863
P ₆		.1818		1303			.1770		948
P ₇		.2121		1391			.2065		1024
P ₈		.2424		1453			.2360		1096
P ₉		.2727		1494			.2655		1159
P ₁₀		.3030		1523			.2950		1211

Gauge No. 1606		Depth 5791			Clock 12 hour				
P ₀	.000 133	.000		69	.000	74	.000		79
P ₁	.0152 114	.0294		359	.376	79	.0288		264
P ₂	.0304 93	.0588		619			.0576		441
P ₃	.0456 114	.0882		852			.0864		604
P ₄	.0608 71	.1176		1033			.1152		742
P ₅	.0760 69	.1470		1180			.1440		853
P ₆		.1764		1297			.1728		942
P ₇		.2058		1390			.2016		1022
P ₈		.2352		1455			.2304		1091
P ₉		.2646		1495			.2592		1158
P ₁₀		.2940		1526			.2880		1211

Reading Interval 2.2

4.5

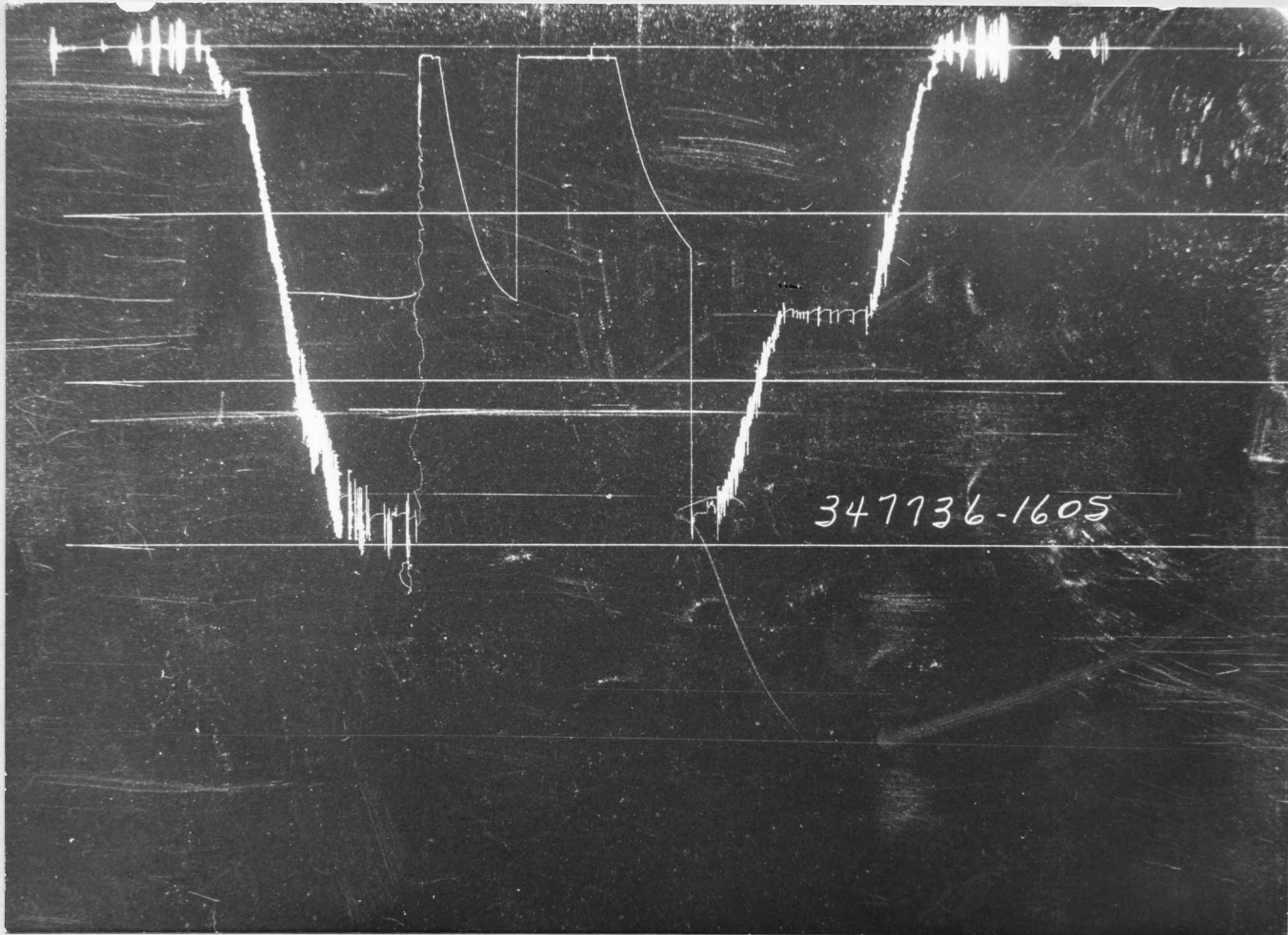
4.5

Minutes

REMARKS:

SPECIAL PRESSURE DATA

↑
PRESSURE
↓



← TIME →



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

Flow Time	1st Min.	2nd Min.	Date	Ticket Number
10		60	12-16-62	347737 S
Closed In Press. Time	1st Min.	2nd Min.	Kind of Job	Halliburton District
45		45	Open hole test	Liberal
Pressure Readings	Field	Office Corrected	Tester	Witness
			White	Roby
Depth Top Gauge	Ft.	Blanked Off	Drilling Contractor	
5781		NO	Same	
BT. P.R.D. No.		Hour Clock	Elevation	Top Packer
1605		12	2718'	5792'
Initial Hydro Mud Pressure			Total Depth	Bottom Packer
2875		2857	5826'	5796'
Initial Closed in Pres.			Interval Tested	Formation Tested
1520		1505	5796'-5826'	Morrow
Initial Flow Pres.			Casing or Hole Size	Casing Perfs. { Top Bot.
60	1	76	7 7/8"	-
45	2	62		
Final Flow Pres.			Surface Choke	Bottom Choke
60	1	63	1"	3/4"
10	2	15		
Final Closed in Pres.			Size & Kind Drill Pipe	Drill Collars Above Tester
1050		1058	4 1/2" FH	I.D. - LENGTH 2 1/4" x 460'
Final Hydro Mud Pressure			Mud Weight	Mud Viscosity
2845		2840	9.3	57
Depth Cen. Gauge	Ft.	Blanked Off	Temperature	Anchor Size & Length
			130 °F Est. °F Actual	ID 3 3/4" OD 5.00" X 30'
BT. P.R.D. No.		Hour Clock	Depths Mea. From	Depth of Tester Valve
			Derrick Floor	5772' Ft.
Initial Hydro Mud Pres.			Cushion	Depth Back Pres. Valve
			- Ft.	5767' Ft.
Initial Closed in Pres.			Recovered	Feet of
			-	
Initial Flow Pres.			Recovered	Feet of
	1			
	2			
Final Flow Pres.			Recovered	Feet of
	1			
	2			
Final Closed in Pres.			Recovered	Feet of
Final Hydro Mud Pres.			Oil A.P.I. Gravity	Water Spec. Gravity
			-	-
Depth Bot. Gauge	Ft.	Blanked Off	Gas Gravity	Surface Pressure
5822		YES	-	psi
BT. P.R.D. No.		Hour Clock	Tool Opened	Tool Closed
1606		12	8:19 A.M. P.M.	10:59 A.M. P.M.
Initial Hydro Mud Pres.			Remarks	
2890		2866	Opened tool for 10 minute 1st flow with gas	
Initial Closed in Pres.				
1525		1505	to surface in 7 minutes. Closed tool for 45 min.	
Initial Flow Pres.				
50	1	78	initial closed in pressure. Reopened tool for	
35	2	59	60 minute 2nd flow with gas gauged at 162,000 CF	
Final Flow Pres.				
50	1	64	and decreasing to 76,000 CF at end of test. Close	
10	2	12	tool for 45 minute final closed in pressure.	
Final Closed in Pres.				
1075		1048		
Final Hydro Mud Pres.				
2855		2842		

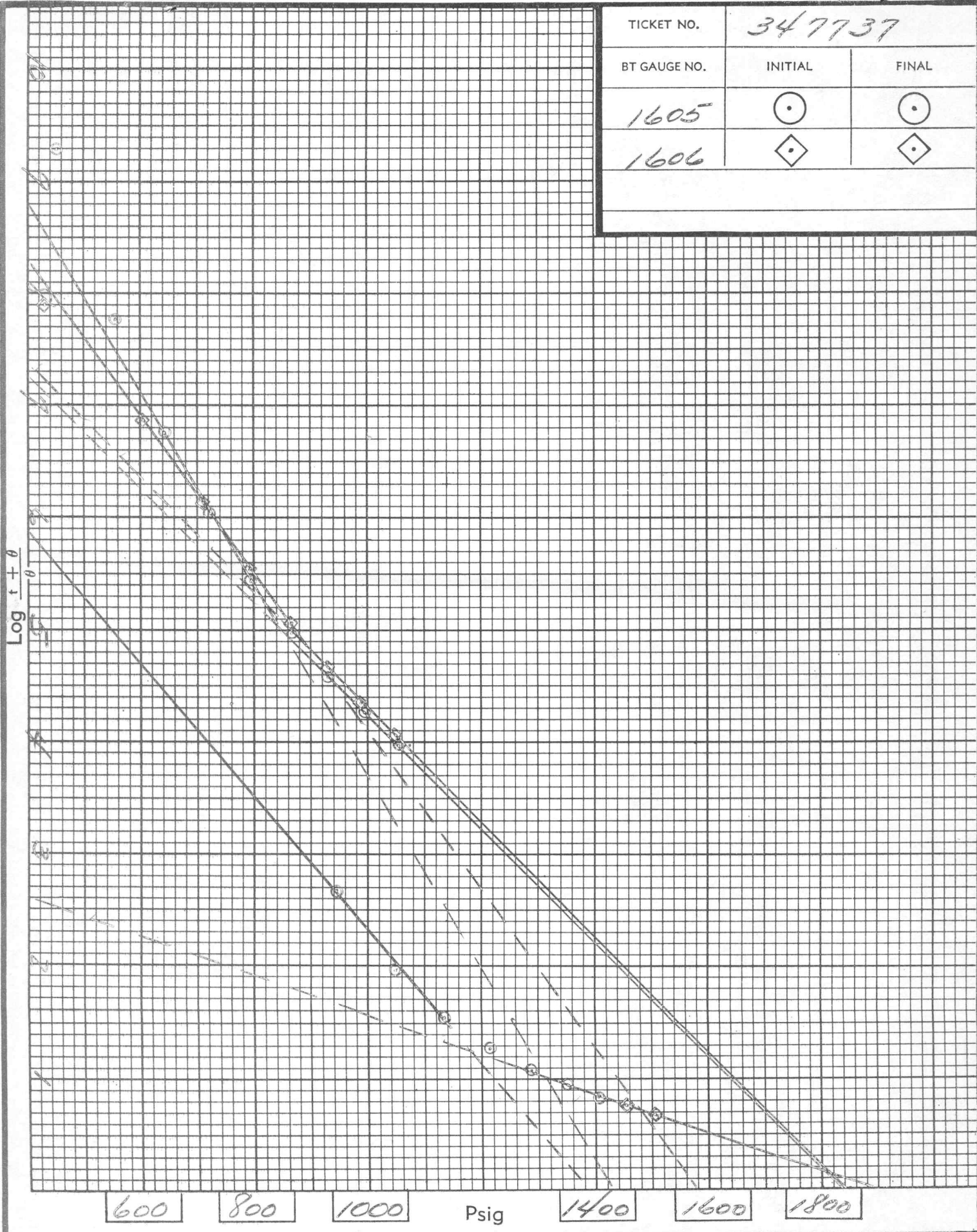
FORMATION TEST DATA

Legal Location Sec - Twp - Rng. SEC. 29 - 33 - 30
 Lease Name A. J. BOND
 Well No. 1
 Test No. 2
 Field Area S. PLAINS
 County MEADE
 State KANSAS
 Lease Owner/Company Name HELMERIC & PAYNE INCORPORATED
 Owner's District GARDEN CITY

Gauge No.		1605		Depth		5781'		Clock		12 hour		Ticket No.		347737	
First Flow Period			Initial Closed In Pressure			Second Flow Period			Final 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.					
P ₀	.000	76	.000	---	63	.000	62	.000	---	15					
P ₁	.011	73	.0321	.434	758	.103	19	.0311	1.205	299					
P ₂	.022	76	.0642	.269	942	.206	17	.0622	.930	454					
P ₃	.033	79	.0963	.196	1047	.309	15	.0933	.779	555					
P ₄	.044	80	.1284	.155	1136	.412	15	.1244	.677	641					
P ₅	.055	63	.1605	.128	1214			.1555	.603	722					
P ₆			.1926	.109	1286			.1866	.544	798					
P ₇			.2247	.095	1350			.2177	.498	865					
P ₈			.2568	.084	1407			.2488	.459	931					
P ₉			.2889	.076	1456			.2799	.426	998					
P ₁₀			.3210	.069	1505			.3110	.398	1058					
Gauge No.		1606		Depth		5822'		Clock		12 hour					
P ₀	.000	78	.000	---	64	.000	59	.000	---	12					
P ₁	.0106	72	.0306	.436	751	.1005	16	.0294	1.217	97					
P ₂	.0212	72	.0612	.271	939	.2010	14	.0588	.941	271					
P ₃	.0318	74	.0918	.024	1045	.3015	14	.0882	.790	433					
P ₄	.0424	78	.1224	.156	1137	.4020	12	.1176	.687	602					
P ₅	.0530	64	.1530	.129	1216			.1470	.612	712					
P ₆			.1836	.110	1289			.1764	.554	794					
P ₇			.2142	.096	1352			.2058	.507	863					
P ₈			.2448	.085	1407			.2352	.468	928					
P ₉			.2754	.076	1457			.2646	.435	986					
P ₁₀			.3060	.069	1505			.2940	.406	1048					
Reading Interval		2		4.5		15		4.5		Minutes					
REMARKS:															

SPECIAL PRESSURE DATA

TICKET NO.	347737	
BT GAUGE NO.	INITIAL	FINAL
1605	○	○
1606	◇	◇



EXTRAPOLATED PRESSURE GRAPH

Gas Production

B.T. Gauge Numbers			1605	1606	Ticket Number		347737	
Initial Hydrostatic			PRESSURE 2857	PRESSURE 2866	Elevation		2718 ft.	
Final Hydrostatic			2840	2842	Production Intial		162 m cu. ft.	
1st Flow	Initial	Time -----	76	78	Rate Final		76 m cu. ft.	
	Final	10	63	64	Hole Size		7.875 in.	
Initial Closed In Pressure			45	1505	1505	Footage Tested		30 ft.
2nd Flow	Initial	-----	62	59	Mud Weight		9.3 lbs. gal.	
	Final	60	15	12	Gas Viscosity		0.013 cp	
Final Closed In Pressure			45	1058	1048	Gas Gravity		0.70 —
Extrapolated Static Pressure	Initial		-	-	Gas Compressibility		0.87 —	
	Final		1818	1820				
Slope $\frac{P_{10} - P_{100}}{P_{10}}$	Initial		-	-				
	Final		285	160				

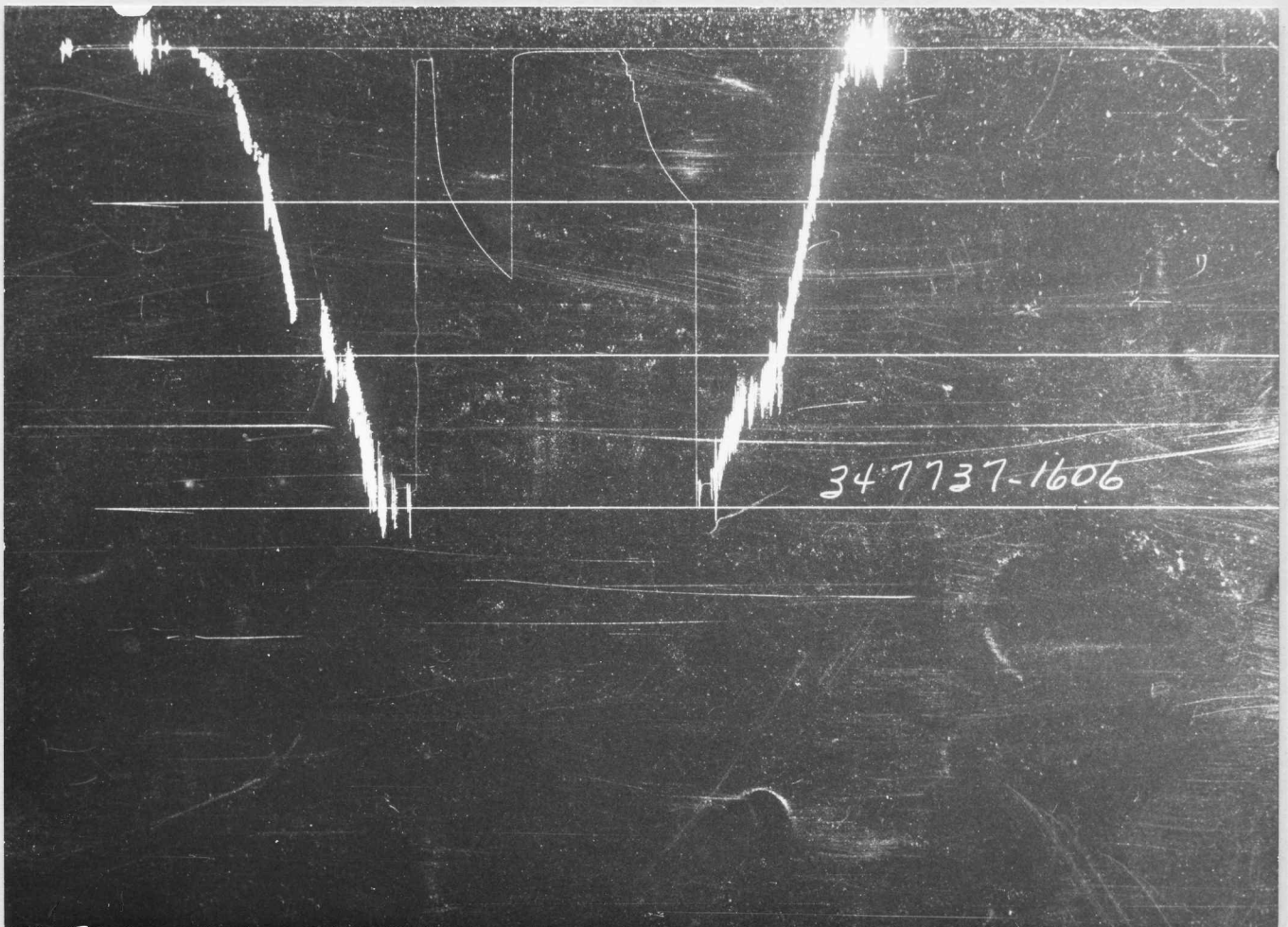
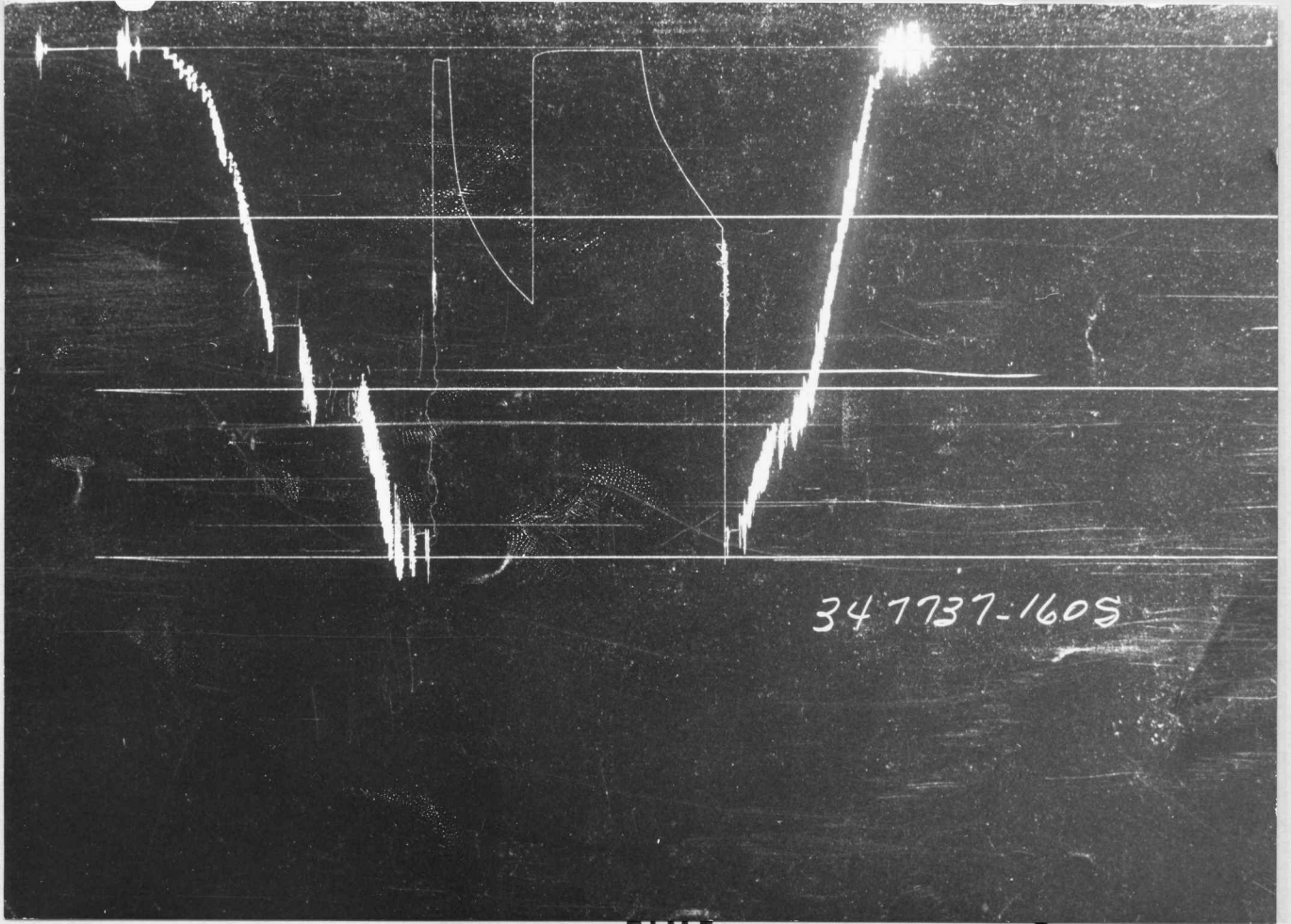
Remarks: A partial permeability pinch-out is indicated

SUMMARY

Product		Equation	BT Gauge Number Depth 1605/5781'		BT Gauge Number Depth 1606/5822'		Units
			Initial	Final	Initial	Final	
Transmissability		$\frac{Kh}{\mu} = \frac{1637 Q_g ZT}{m}$		33.2		25.8	md. ft. cp
Theoretical Flow Capacity		$Kh = \frac{Kh}{\mu} \mu$		0.4		0.3	md. ft.
Average Effective Permeability		$K = \frac{Kh}{h}$		0.01		0.01	md.
Permeability		$K_1 = \frac{Kh}{h_1}$		-		-	md.
Indicated Flow Capacity		$(Kh)_2 = \frac{3200 Q_g \mu ZT \log(0.472 b/r_w)}{P_s^2 - P_r^2}$		0.2		0.2	md. ft.
Damage Ratio		$DR = \frac{\text{Theo. Flow Cap}}{\text{Indicated Flow Cap}} \frac{Kh}{(Kh)_2}$		1.8		2.1	—
Indicated Flow Rate		$OF_1 = \frac{Q_g}{P_s^2 - P_r^2} \frac{P_s^2}{P_r^2} \text{ Max.}$		76.0		76.0	MCFD
Flow Rate		$OF_2 = \frac{Q_g}{\sqrt{P_s^2 - P_r^2}} \frac{P_s}{P_r} \text{ Min.}$		76.0		76.0	MCFD
Theoretical Potential Rate		$OF_3 = OF_1 DR \text{ Max.}$		140.5		158.9	MCFD
Potential Rate		$OF_4 = OF_2 DR \text{ Min.}$		140.5		158.9	MCFD
Approx. Radius of Investigation		$b \approx \sqrt{Kt} \text{ or } \sqrt{Kt_0}$		1.3		1.2	ft.
		$b_1 \approx \sqrt{K_1 t} \text{ or } \sqrt{K_1 t_0}$		-		-	ft.
Potentiometric Surface *		$Pot. = (EI - GD) + (2.319 P_s)$		317.4		659.0	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.

INTERPRETATIONS AND CALCULATIONS



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