

NATURAL GAS ENGINEERING SERVICE

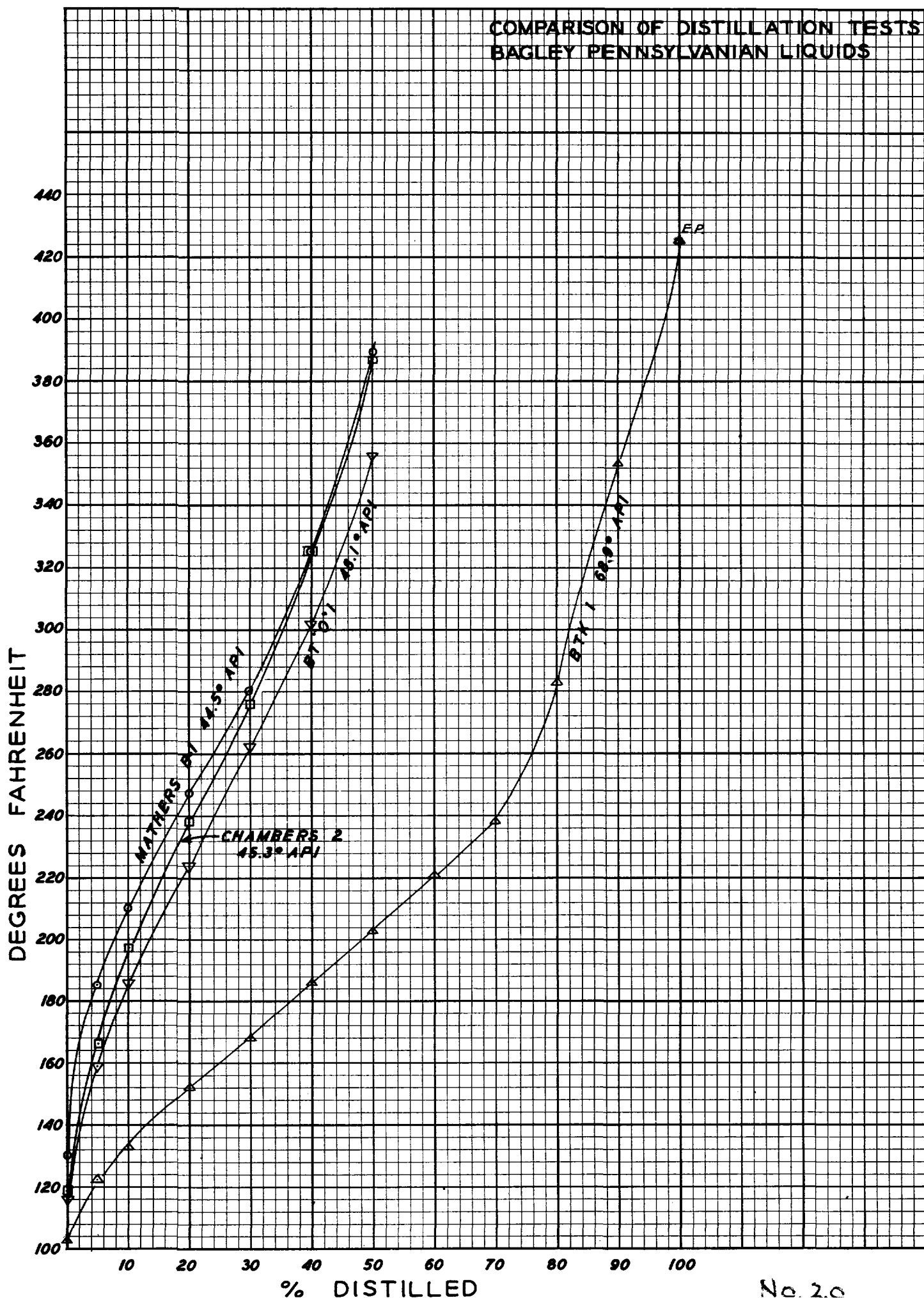
MAIN OFFICE 8000
 24 Andover Hwy. — MU 3-2652
 MIDLAND, TEXAS

1958 AUG 6 AM 8:29

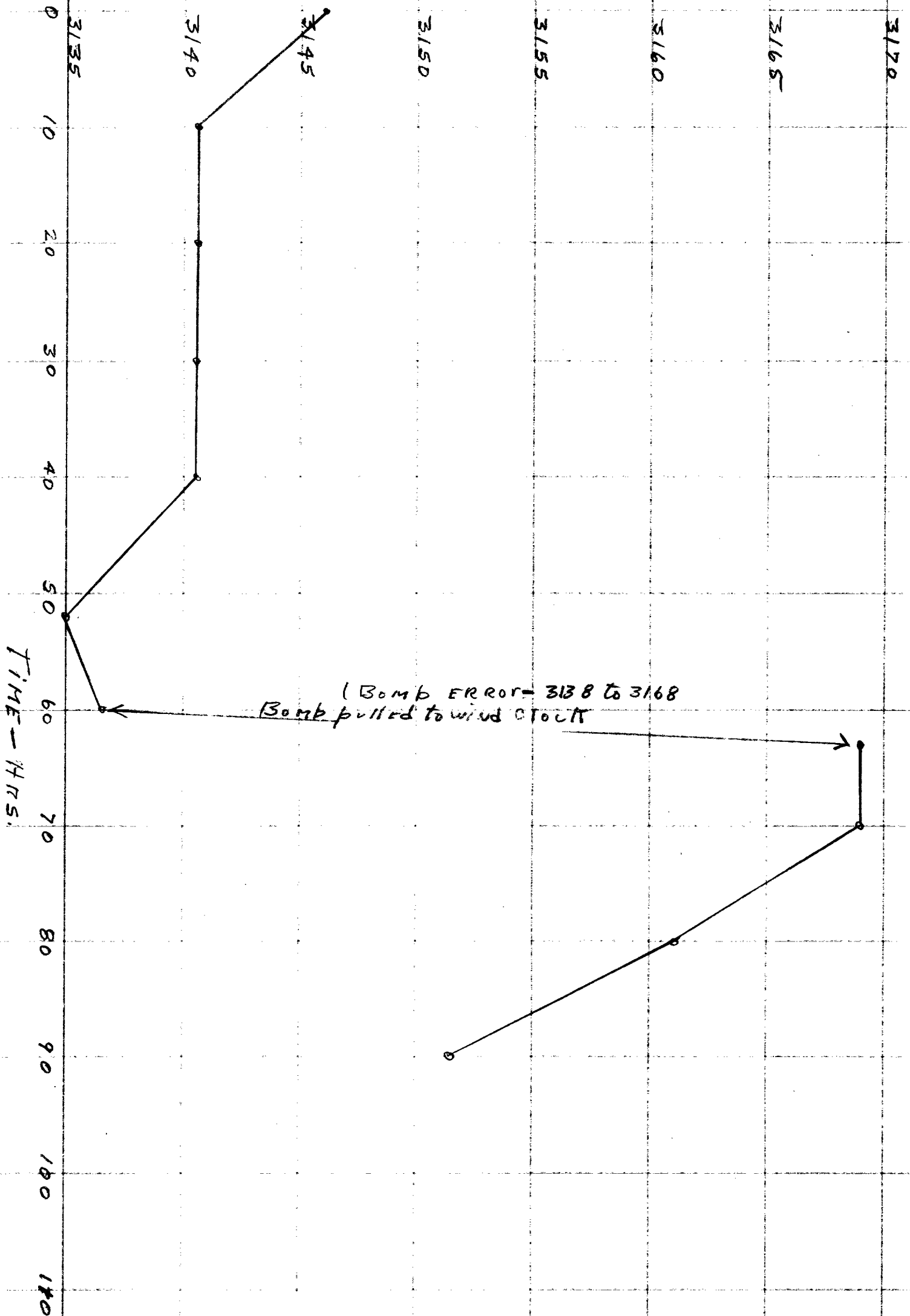
LABORATORY DATA

TEST NO.	DT-58-339 ④	DT-58-340 ⑤	DT-58-341 ①	DT-58-342 ②
Sample	B T K No.1 Gas Zone	B T O No.1 Oil Zone	Mathers B - 1	Chambers No.2
I.B.P.	103°F	116°F	130°F	118°F
5%	122	159	185	166
10%	133	186	210	197
20%	152	224	247	238
30%	168	262	280	276
40%	186	302	325	325
50%	203	356	389	387
60%	221			
70%	238			
80%	283			
90%	353			
End Point	425			
Recovery	93.5%	50.0%	50.0%	50.0%
Residue	0.5	46.0	48.5	47.0
Loss	6.0	4.0	1.5	3.0
Gravity, API	68.9°	48.1°	44.5°	45.3°

COMPARISON OF DISTILLATION TESTS BAGLEY PENNSYLVANIAN LIQUIDS



PRESSURES
B.H. - psia.



BHP BUILD-UP AND INTERFERENCE TESTS

Started on July 8 - With Shell State A Unit No. 1 flowing at a rate of 1,650 MCF per day and Caudle No. 7 flowing at a rate of 2,290 MCF per day.

- (1) Bottom hole pressure gauge was run in Shell State A Unit No. 1. The well was then shut-in and the pressure build-up recorded for 38 hours.

BHP was 3,056 psi with the well flowing and after the 38 hours of shut-in had built up to 3,126 psi.

- (2) The gauge was pulled from Shell State A Unit No. 1 and run in Caudle No. 7. The well was then shut-in and the pressure build-up recorded for 42 hours.

Pressures were taken about 1100 feet above the producing formation because of an obstruction in the tubing. Based on the gradient the pressure in this well would be comparable to that found in Shell State A Unit No. 1.

The flowing pressure at that point was 2649 psi, after two hours shut-in the pressure was 2966 psi and at the end of the 42 hours recorded the pressure was 2963 psi.

- (3) The gauge was pulled from Caudle No. 7 and re-run in Shell State A Unit No. 1. At this point, after the State A Unit No. 1 had been shut-in for 96 hours, Caudle No. 7 was reopened and produced at a rate of

4,000 MCF per day. The pressure in Shell State A Unit No. 1, was recorded continuously for 65 hours. The gauge was then pulled and re-run to record the pressures from the 68th to the 90th hour after production was started from Caudle No. 7.

The shut-in pressure found after the 96 hour shut-in was 3147 psi after Caudle No. 7 was opened, the pressure in Shell State A Unit No. 1 declined 9 lbs. The gauge was pulled and re-run and an additional decline of 15 psi was recorded.

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REC'D SEP 11 AM 0 11
MAIL OFFICE COB

BAGLEY (UPPER) PENNSYLVANIAN GAS POOL
GAS PRODUCTION - MCF

	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL	ACCUM. TOTAL
W. E. Mathers #2	-	-	-	5,423	31,134	15,987	13,688	13,822	12,154	8,103	6,160	11,915	118,386	118,386
1952														
W. E. Mathers #2	47,731	39,040	41,349	37,965	24,110	31,406	36,267	38,146	20,041	41,817	15,550	30,273	403,695	522,081
1953														
W. E. Mathers #2	26,722	26,858	37,910	24,908	26,388	30,164	29,788	19,183	20,609	29,175	9,198	15,022	295,925	818,006
1954														
W. E. Mathers #2	18,264	9,838	13,422	16,823	10,428	8,709	16,204	17,289	11,350	21,924	28,948	28,502	201,701	1,019,707
1955														
W. E. Mathers #2	28,072	15,480	8,291	11,077	8,633	10,339	9,377	9,291	8,624	11,101	12,582	13,743	147,110	1,166,817
1956														
W. E. Mathers #2	14,134	11,799	9,839	8,554	8,259	6,890	7,903	10,392	12,541	11,372	13,333	10,971	125,987	1,292,804
1957														
W. E. Mathers #2	10,922	9,461	13,181	11,177	18,330	15,440	17,823	17,770	17,598	11,412	0	0	143,114	1,435,913
State "C" Ac/2 #1	-	-	-	-	-	-	-	-	-	27,810	60,656	56,944	145,420	145,420
1957 TOTALS	10,922	9,461	13,181	11,177	18,330	15,440	17,823	17,770	17,598	39,222	60,656	56,944	288,524	1,581,328
1958														
State "C" Ac/2 #1	88,361	91,074	105,105	81,517	95,783									
State BTK #1				7,330	11,168									
1958 TOTALS	88,361	91,074	105,105	88,847	106,951									

BOTTOM-HOLE PRESSURE HISTORY

BAGLEY UPPER PENNSYLVANIAN GAS POOL

<u>Date</u>	<u>Pressure @ -4445</u>	<u>Change</u>	<u>Date</u>	<u>Pressure @ -4445</u>	<u>Change</u>
<u>Mathers #2</u>					
5-8-51	2475	Initial	12-19-55	2438	- 86
6-5-51	2323	-152	6-4-56	2463	25
11-26-51	2181	-142	12-13-56	2505	42
12-18-52	2440	259	2-12-57	2506	1
6-1-53	2028	-412	10-7-57	2333	-273
12-4-53	1958	- 70	4-24-58	2499	166
12-6-54	2059	101	6-27-58	2513	14
7-7-55	2524	465			

Caudle #7

2-5-57	2692	Initial
8-29-57	2657	- 35
10-1-57	2675	18
6-27-58	2404	-271

State BT "K" #1

5-5-58	2430	Initial
6-20-58	2377	- 53

Mathers "B" #1

4-24-58	1649 (48 hrs)	Initial
6-20-58	1959 (69 hrs)	310

PRESSURE - PRODUCTION SUMMARY
BAGLEY - UPPER PENNSYLVANIAN GAS POOL

<u>DATE</u>	<u>PRESSURE @ 4445'</u>	<u>PRESSURE CHARGE</u>	<u>CUMULATIVE GAS PRODUCTION - MCF</u>	<u>CUMULATIVE DISTILLATE PRODUCTION</u>	<u>TOTAL WITHDRAWALS MCF GAS</u>	<u>CALCULATED DRAINAGE AREA ACRES*</u>
	3008 F _{ss}	Original	Pressure from DST			
5- 8-51	2873'	135	13,207	5,189	17,903	79
6- 5-51	2831'	177	36,557	8,174	43,857	148
11-26-51	2776'	232	106,471	14,374	119,069	307
12-18-52	2797'	211	506,945	24,788	528,924	1,497
6- 1-53	2676'	332	664,867	27,785	688,454	1,239
12- 4-53	2638'	370	802,984	31,049	829,024	1,338
12- 6-54	2622'	384	998,330	37,165	1,029,439	1,593
7- 7-55	2715'	293	1,104,443	40,933	1,140,030	2,324
12-19-55	2676'	332	1,159,946	43,223	1,197,026	2,153
6- 4-54	2662'	346	1,219,402	45,576	1,258,369	2,172
12-13-56	2651'	357	1,287,318	48,072	1,328,345	2,222
2-12-57	2644'	364	1,308,457	48,832	1,350,036	2,215
10- 7-57	2589'	431	1,434,312	52,183	1,477,809	2,107
4-24-58	2466'	542	1,954,715	66,818	2,007,780	2,213
6-27-58	2421'	587	2,161,666	72,522	2,218,266	2,257

*Calculated drainage area = 2257 acres

Based on:

Porosity = 6%

Water saturation = 20%

Average pay thickens = 15'

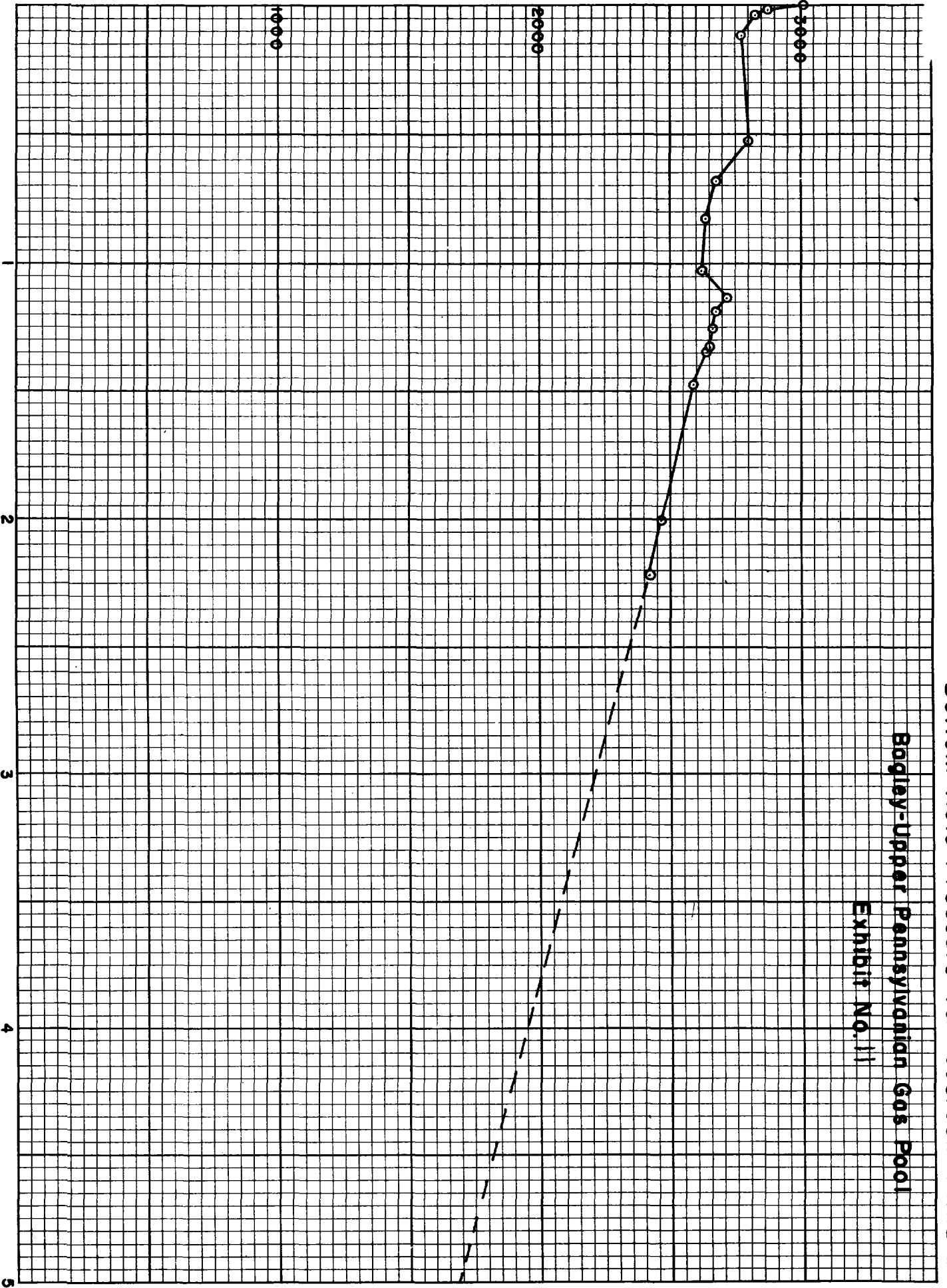
Bottom-Hole Pressure-PSIG

Bottom-Hole Pressure Vs. Reservoir Withdrawals

Bogley-Upper Pennsylvanian Gas Pool

Exhibit No. 11

Reservoir Withdrawals-Billion Cubic Feet



SALES OFFICE CDD

BAGLEY (LOWER) PENNSYLVANIAN GAS POOL

GAS PRODUCTION - MCF

1954 JAN. 1955

FEB. MARCH APRIL MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. TOTAL

ACCUM. TOTAL

Shell St. "A" #1 - - - - 15,692 45,237 48,907 46,895 9,296 8,252 35,649 209,928 209,928

1955

Shell St. "A" #1 33,972 23,029 53,379 48,326 60,209 53,771 55,121 52,506 42,401 20,964 7,577 23,480 474,736 684,563

1956

Shell St. "A" #1 18,323 50,252 53,231 69,848 72,745 54,118 60,501 66,951 66,090 61,413 64,153 64,661 702,286 1,386,949

State "C" Ac/2 #1 - - - - - 21,544 24,726 24,936 28,273 26,942 27,205 153,626 153,626

1956 TOTALS

18,323 50,252 53,231 69,848 72,745 54,118 82,045 91,677 91,026 89,686 91,095 91,866 855,912 1,540,575

1957

Shell St. "A" #1 51,852 47,479 51,726 42,256 43,698 43,595 37,937 47,778 43,843 60,107 49,501 52,578 572,350 1,959,299

Candle #7 - - - 106,808 57,637 12,954 69,797 55,088 46,650 74,048 65,222 70,894 559,098 559,098

State "C" Ac/2 #1 15,038 23,030 26,550 26,933 25,555 23,635 21,618 22,030 15,329 5,717 1,686 4,385 211,506 365,132

1957 TOTALS

66,890 70,509 78,276 175,997 126,890 80,184 129,352 124,896 105,822 139,872 116,409 127,857 1,342,954 2,883,529

1958

Shell St. "A" #1 51,515 49,430 60,424 36,481 56,324

Candle #7 66,706 56,802 67,502 47,930 71,546

State BTUON #1 - 7,265 - 42,392

State "C" Ac/2 #1 8,525 7,265 8,260 7,573 8,475

1958 TOTALS

126,746 120,762 136,186 91,984 178,737

BOTTOM-HOLE PRESSURE HISTORY
BAGLEY LOWER PENNSYLVANIAN GAS POOL

Amerada-Shell State "A" #1

<u>DATE</u>	<u>PRESSURE @ -5500'</u>	<u>CHANGE</u>
10-51	3604	Initial
1-16-56	3558	- 46
2-4-57	3161	-397
7-8-57	3122	- 39
7-12-57	3143	- 21
4-24-58	2835	-308
6-30-58	2813	- 22

Cudde #7

<u>DATE</u>	<u>PRESSURE @ -5500'</u>	<u>CHANGE</u>
2-4-57	3229	Initial
7-10-57	3085	-144
4-24-58	2649	-436
6-20-58	2551	- 98

State BT"0" #1

<u>DATE</u>	<u>PRESSURE @ -5500'</u>	<u>CHANGE</u>
1-27-58	3030	Initial
4-22-58	2917	-113
6-20-58	2865	- 52

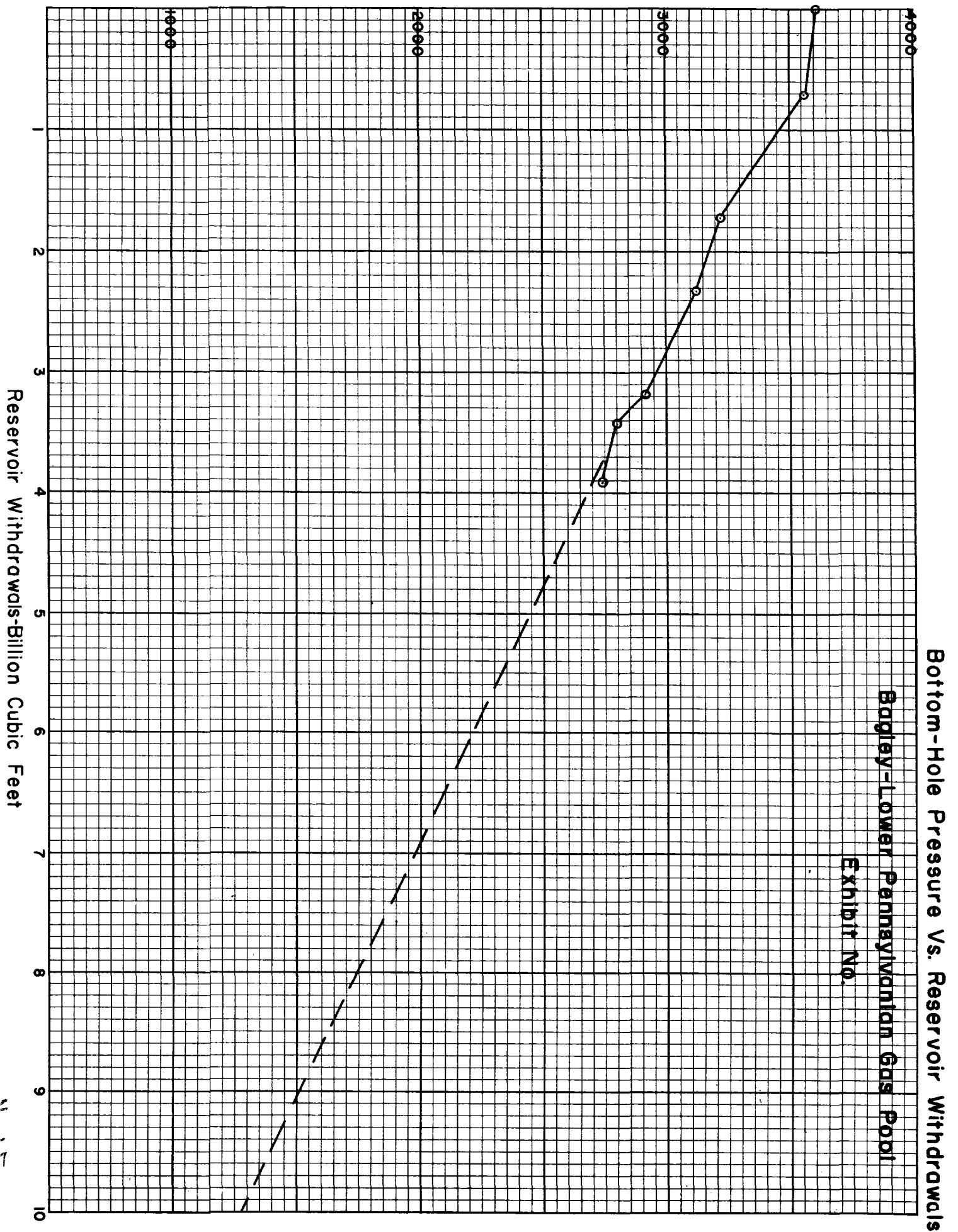
PRESSURE - PRODUCTION SUMMARY
BAGLEY - LOWER PENNSYLVANIAN GAS POOL

<u>DATE</u>	<u>PRESSURE @ 5500'</u>	<u>PRESSURE CHARGE</u>	<u>CUMULATIVE GAS PRODUCTION - MCF</u>	<u>CUMULATIVE DISTILLATE PRODUCTION</u>	<u>TOTAL WITHDRAWALS MCF GAS @ 15Bbls.</u>	<u>CALCULATED DRAINAGE AREA - ACRE*</u>
10- 5-51	3604	Initial				
1-16-56	3558'	46	693,825	52,632	714,091	
2- 4-57	3222'	382	1,607,465	112,071	1,723,601	1,892
7-10-57	3128'	476	2,181,102	148,055	2,330,072	2,053
4-27-58	2913'	691	3,010,275	197,054	3,194,983	1,939
4-24-58	2800'	804	3,236,211	214,837	3,429,820	1,789
6-20-58	2743'	861	3,707,944	232,363	3,913,820	1,902

*Calculated drainage area = 1902 acres.

Based on:
 Porosity = 6%
 Water Saturation = 20%
 Average Pay thickness = 20'

Bottom Hole Pressure-PSIG



COPIED FROM RECORD
 198 JUL 22 AM 8:11

PRODUCTION TESTS

BAGLEY PENNSYLVANIAN WELLS

<u>Well</u>	<u>Date Of Test</u>	<u>Daily Production</u>			<u>GOR</u>	<u>Tubing Pressure</u>	<u>Gravity Deg-API</u>
		<u>Oil-Dist. Bbls</u>	<u>Water Bbls</u>	<u>Gas MCF</u>			
<u>Bagley Upper Pennsylvanian Gas Zone</u>							
Mathers "B" #1	1-20-58	58	Tr.	357.9	6,170		
	3-27-58	47	Tr.	332.9	7,083		
	5-22-58	44	Tr.	220.7	5,015	180	44.8
Mathers #2	7-12-58	30	Tr.	791.4	26,380		63.4
State BT "K" #1	6-10-58	26	0	855.4	32,900	1710	71.0
Caudle #7	Not on production						

Bagley State BT "O" Oil Zone

State BT "O" #1	1-23-58	66	Tr.	427.3	6,474		
	4-8-58	41	Tr.	184.5	4,499		
	6-10-58	31	0	59.7	1,926	60	46.7

Bagley Lower Pennsylvanian Gas Zone

Caudle #7	6-12-58	119	5	1,950.3	16,389	1600	57.8
APC-Shell State "A" #1	6-12-58	99	2	2,445.9	24,706	2100	69.3
State BT "O" #1	6-10-58	37	0	873.2	23,600	1885	67.7

MAIN OFFICE OCC

PRODUCTION DATA

1957 JUL 18 : 11

		<u>Monthly Oil Production - Bbl's</u>	<u>Monthly Gas Production - M.C.F.</u>	<u>Producing G.O.R.</u>
1957	May	1,077		
	June	3,045		
	July	2,483	5,765	2,322
	August	2,375	7,032	2,961
	September	2,109	6,215	2,947
	October	2,013	6,550	3,254
	November	1,835	7,640	4,163
	December	1,798	6,942	3,861
1958	January	1,692	7,461	4,410
	February	1,423	5,879	4,131
	March	1,488	5,414	3,638
	April	1,263	5,798	4,591
	May	<u>1,308</u>	8,274	6,326
Cumulative		23,909		

MAIN OFFICE 000
 PRODUCTION DATA : 11
 STATE BT "Q" #1
 1958 05

<u>Year</u>	<u>Month</u>	<u>Monthly Oil Production - Bbl's</u>	<u>Monthly Gas Production - M.C.F.</u>	<u>Producing G.O.R.</u>
1957	December	1,602		
1958	January	1,813	5,442	3,002
	February	1,713	6,055	3,535
	March	1,440	5,112	3,550
	April	1,173	2,728	2,326
	May	1,025	2,442	2,382
Cumulative		8,766		