

24 B

BRUNSON POOL BOTTOM HOLE PRESSURES
Pool Datum - 4,300' Nominal Shut-in Time 4.8 hrs.

COMPANY	WELL	DATE	PRESS.	TIME S.I.	GAUGE	GRADIENT	B.H.P. @	B.H.P. @	PREVIOUS TEST
LEASE	UNIT	S.T.R.	RUN	HRS/MIN.	DEPTH	TBY	GAUGE DEPTH	FIELD DATUM	PRESS. DATE
AMERADA PET. CORP.									
Corrigan	5 G	4-22-37	11-7-49	51/00	7766			1836	1972 6-3-49
"	6 B	"	"	50/30	7666	30#/100'	1669	1699	1950 "
"	7 H	"	"	54/15	7597	30#/100'	1567	1642	1701 "
"	11 A	"	"	51/50	7559	30#/100'	1993	2053	2168 "
Hare	4 N	33-21-37	"	53/30	7759			2061	2175 6-6-49
"	5 K	"	"	52/45	7756			1871	1853 "
Walden	1 K	15-22-37	11-8-49	51/30	7691			862	1104 6-7-49
"	3 N	"	"		7693				1066 "
"	4 L	"	"		7710				1208 "
Wood	5 B	22-22-37	11-8-49	49/00	7675			1605	1640 "
"	6 A	"	"	48/30	7510	30#/100'	1628	1673	1901 "
CARTER, A. G. FOUNDATION									
Elliott	3 C	22-22-37	11-8-49	47/15	7686	Gas		564	490 6-22-49
CITIES SERVICE OIL CO.									
Brunson B	1 I	4-22-37	11-7-49	49/00	7547	30#/100'	2041	2101	2229 6-13-49
"	6 M	3-22-37	"	50/00	7394	30#/100'	2189	2292	2398 "
CONTINENTAL OIL CO.									
Elliott A-15	3 O	15-22-37	11-18-49	50/10	7682			1221	1580 5-5-49
"	5 P	"	"	49/55	7670			1169	1381 "
"	B-15	2 I	"	49/00	7372	3#/100'	916	925	1036 "
Lockhart A-27	1 E	27-21-37	"	52/30	7700	30#/100'	2718	2727	
Wantz	1 O	21-21-37	"	52/45	7759			2442	
GULF OIL CORP.									
Carson, J.N.	5 J	28-21-37	11-9-49	50/25	7744			2471	2630 5-26-49
"	7 B	33-21-37	"	54/00	7570	30#/100'	2221	2278	2426 5-18-49
"	8 O	28-21-37	"	50/00	7751			2474	2645 "
"	9 K	"	"	52/00	7755			2500	2656 5-26-49
"	"C"	5 A	33-21-37	52/55	7400	30#/100'	2061	2162	2337 5-18-49
"	6 P	28-21-37	"	51/20	7390	30#/100'	2195	2302	2450 "
"	8 H	"	"	52/00	7560	30#/100'	2009	2061	
"	"	"	"		7716				
Cole "A"	5 I	16-22-37			7718				
"	6 B	"	11-10-49	50/25				1157	1241 5-25-49

BRUNSON B.H.P. CONT'D.										PREVIOUS TEST	
COMPANY	WELL	UNIT	S.T.R.	DATE PRESS.	TIME S.I.	GAUGE DEPTH	GRADIENT	B.H.P. @	B.H.P. @	PRESS.	DATE
LEASE				RUN	HRS/MIN.	FT	TBY	GAUGE DEPTH	FIELD DATUM		
GULF OIL CONT'D.											
Cole "A"	7	H	16-22-37	11-10-49	51/00	7716			1490	1822	5-19-49
King	7	G	28-21-37	"	52/10	7717			2307	2649	5-20-49
"	10	B	"	"	54/00	7756			2339	2471	5-26-49
"	12	A	"	"	53/50	7741			2474	2573	"
"	15	F	"	"	51/40	7761			2493		
"	17	C	"	"	53/15	7766			2512		
"	18	E	"	"	53/50	7768			2480		
Rinewalt	2	E	4-22-37	11-9-49	49/35	7756			2067	2230	5-19-49
titcher	2	N	"	"	48/50	7740			2073	2208	6-24-49
HUMBLE OIL & RFG. CO.											
Ferrel	2	A	22-22-37			7648			W.O.	2278	5-30-49
Greenwood	8	K	9-22-37							Pump	2069
"	9	J	"	11-14-49	51/00	7722			1955	2069	5-30-49
"	10	P	"	"	52/00	7578			1791	1798	"
"	12	O	"	"	51/50	7724			1897	1991	"
"	13	L	"	"						Pump	
MAGNOLIA PET. CO.											
Brunson	9	B	9-22-37	11-15-49	53/20	7736			2137	2305	5-12-49
"	10	G	"	"	53/45	7733			1968	2117	"
"	11	A	"	"	52/50	7542			2109	2112	"
"	16	D	10-22-37	"	52/10	7774			2308		
Carson, E.O.	10	F	33-21-37	11-16-49	66/35	7764			2545	1411	5-9-49
"	13	G	"	11-15-49	49/30	7561			2079	2267	"
"	14	C	"	"		7771			Kobe	2573	"
"	16	D	"	"		7774			No Run	2585	"
"	17	N	"	11-15-49	50/00	7761			2435	2607	5-10-49
"	18	M	28-21-37	"	49/30	7761			2343	2630	"
"	19	L	"	"		7774			Kobe	2615	"
Carson, J.N.	2	H	33-21-37	11-16-49	48/45	7362			1871	2180	"
Corrigan	1	O	"	"	48/45	7577			1871	2107	5-11-49
"	4	J	"	"	49/15	7551			1926	2160	6-8-49
"	7	P	"	"	48/10	7399			1839	2037	5-11-49
PENROSE, N. G.											
Elliot B-9	4	C	9-22-37	11-17-49	49/15	7735			1352	1685	6-23-49
Penrose	1	F	"	"	50/45	7729			1708	1984	"

BRUNSON B.H.P. CONT'D.

COMPANY	WELL	UNIT	S.T.R.	DATE PRESS.	TIME S.I.	GAUGE	GRADIENT	B.H.P. @	B.H.P. @	PREVIOUS TEST
LEASE				RUN	HRS/MIN.	DEPTH	TRY	GAUGE	DEPTH	DATE

PENROSE, N. G. CONT'D.

Penrose	3 E		9-22-37							
Walden	4 E		15-22-37	11-17-49	49/50	7708	Gas		1525	Pump

ROMAN OIL CO.

Elliott B-9	3 D		9-22-37							
Walden	3 C		15-22-37	11-8-49	54/00	7496	30#/100'	1452	1515	Pump
"	6 D		"	"	54/30	7607			1570	"
Elliott A-15	1 J		"	"	55/15	7642	30#/100'	1067	1082	1284

SHELL OIL CO.

Rhinewalt	3 F		4-22-37							
"	4 C		"	11-18-49	48/00	7756			2080	2194
"						7748				2187

SINCLAIR OIL & GAS CO.

Brunson	4 O		4-22-37	11-14-49	47/45	7726	30#/100'	2064	2086	2195
"	5 J		"	"	48/20	7699			2079	2165
"	8 L		"	"	47/15	7423	30#/100'	2099	2190	2305

SKELLY OIL CO.

Baker B	6 M		10-22-37							
Stitcher	1 K		4-22-37	11-16-49	48/30	7749			2083	2217
"	4 L		"	"	49/10	7756			2089	2217

SOUTHERN PET. EXPL. CO.

Rhinewalt B	1 D		4-22-37	11-17-49	49/25	7763			2083	2211
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STANOLIND OIL & GAS CO.

Corrigan	2 I		33-21-37	11-18-49	48/30	7349	3#/100'	1766	1778	1948
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TIDEWATER ASSOC. OIL CO.

Brunson	1 P		4-22-37	11-18-49	52/00	7544	30#/100'	2099	2158	2254
Clifton	2 M		"							Pump

ALL WELLS RUN

TOTAL PRESSURE

AVERAGE PRESSURE

CHANGE

64 wells run May/June 1949	129,330	2020.8	
64 wells run Nov/Dec. 1949	124,955	1952.4	- 68.4

COMPARABLE WELLS

56 wells run May/June 1949	113,796	2032.1	
56 wells run Nov/Dec. 1949	106,407	1900.1	- 132.0

Pressures are incomplete. 4 wells have not been run.

BRUNSON POOL

PRESSURE-PRODUCTION DATA

Press. Survey	Press. -4300	Wells Bombed	No. Wells in Pool	Prod. Bbls. Period	Prod. Bbls. Cumulative	Press.Drop Period	Press.Drop Cumulative	Bbls./Lb. Period	Drop Cumulative
Sept. 14, 1945	2945	1	1	0	0	0	0	0	0
Dec. 1, 1946	2860	14	15	304,864	304,864	85	85	3,587	3,587
June 1, 1947	2705	25	33	433,641	738,505	155	240	2,798	3,077
Dec. 1, 1947	2551	40	45	812,426	1,550,931	154	394	5,275	3,936
June 1, 1948	2479	51	57	1,169,745	2,720,676	72	466	16,246	5,838
Dec. 1, 1948	2288	56	65	1,398,655	4,119,331	191	657	7,323	6,270
June 1, 1949	2021	64	74	1,520,927	5,640,258	267	924	5,696	6,104
Dec. 1, 1949	1908	68	79	1,507,000	7,147,258	113	1037	13,336	6,892
Feb. 1, 1950	1880	68	79	552,979	7,700,237	28	1065	19,749	7,230
Aug. 1, 1950	1809	72	86	1,007,311	8,707,548	71	1136	14,187	7,665

BRUNSON POOL BOTTOM HOLE PRESSURES
Datum - 4300' Shut-In Time 48 Hours

COMPANY LEASE	WELL UNIT	S.T.R.	1949 May-June	1949 Nov.-Dec.	1950 1st Feb.	1950 1st Apr.	1950 1st June	1950 1st Aug.
<u>AMERADA PET. CORP.</u>								
Corrigan	5 G	4-22-37	1972	1836	1767			1763
"	6 B	"	1950	1699	1582			1765
"	7 H	"	1701	1642				1618
"	11 A	"	2168	2053	1956	1976	1948	1888
Hare	4 N	33-21-37	2175	2061	1962			1905
"	5 K	"	1853	1871	1552	1583	1715	1704
Walden	1 K	15-22-37	1104	862	802	804	744	697
"	3 N	"	1066	872	783			666
"	4 L	"	1208	920	848			709
Wood	5 B	22-22-37	1640	1605	1592			1508
"	6 A	"	1901	1673	1557	1568	1636	1622
<u>CARTER, A. G. FOUNDATION</u>								
Elliott	3 C	22-22-37	490	564				
<u>CITIES SERVICE OIL CO.</u>								
Brunson B	1 I	4-22-37	2229	2101	2044	1971	1926	1874
"	6 M	3-22-37	2398	2292	2140			2121
<u>CONTINENTAL OIL CO.</u>								
Elliott A-15	3 O	15-22-37	1580	1221	1120			1025
"	5 P	"	1381	1169	1260			743
Elliott B-15	2 I	"	1036	925	860			1026
Lockhart A-27	1 E	27-21-37		2727	2640			2524
Wantz E	1 O	21-21-37		2442	2280			
"	2 N	"			2050			
<u>GULF OIL CORP.</u>								
Carson, J.N.	5 J	28-21-37	2630	2471	2413			2307
"	7 B	33-21-37	2426	2278	2190			2078
"	8 O	28-21-37	2645	2474	2404	2373	2348	2295
"	9 K	"	2656	2500	2439			2287
Carson C	5 A	33-21-37	2337	2162	2087			1983
"	6 P	28-21-37	2450	2302	2219			2116
"	8 H	"		2061	2048			1804
Cole A	5 I	16-22-37	1015	898	869			628
"	6 B	"	1241	1157	1502			797
"	7 H	"	1822	1490		1184	1083	963
Eubank	5 B	22-21-37						2720
"	6 G	"						2704
King	7 G	28-21-37	2649	2307	2404			2334
"	10 B	"	2471	2339	2069			2098
"	12 A	"	2573	2474	2383			2253
"	15 F	"		2493	2356	2345	2340	2303
"	17 C	"		2512	2387			2330
"	18 E	"		2480	2252			2121
"	21 H	"						2380
Rinewalt	2 E	4-22-37	2230	2067	2012			1855
Stitcher	2 N	"	2208	2073	1999	1941	1911	1824

BRUNSON POOL B.H.P.'S CONT'D.

COMPANY	WELL	1949	1949	1950	1950	1950	1950
LEASE	UNIT	S.T.R.	May-June	Nov.-Dec.	1st Feb.	1st Apr.	1st June
							1st Aug.

HUMBLE OIL & RFG. CO.

Ferrel	2	A	22-22-37	2278	Plugged		
Greenwood	8	K	9-22-37	Pump			
"	9	J	"	2069	1955	1850	1826 1749 1658
"	10	P	"	1798	1791	1646	1626
"	12	O	"	1991	1897	1775	1693
"	13	L	"	Pump			

MAGNOLIA PET. CO.

Brunson	9	B	9-22-37	2305	2137	2026		1886
"	10	G	"	2117	1968	1877		1743
"	11	A	"	2112	2109	2007	2003 1953	1879
"	16	D	10-22-37		2308	2175		2109
Carson, E.O.	10	F	33-21-37	1411	2545	2383		Pump
"	13	G	"	2267	2079	2016		Pump
"	14	C	"	2573	Pump			
"	16	D	"	2585		2354		Pump
"	17	N	"	2607	2435	2304		2260
"	18	M	28-21-37	2630	2343	2291	2294 2224	2210
"	19	L	"	2615	Pump			
Carson, J.N.	2	H	33-21-37	2180	1991	1935	1934 1933	1952
Corrigan	1	O	"	2107	1871	1867		1775
"	4	J	"	2160	1926	1926		1826
"	7	P	"	2037	1839	1807		1868

OHIO OIL CO.

Warlick C	5	P	15-21-37					2697
Marshall	7	D	27-21-37					2426

PENROSE, N. G.

Elliott B-9	4	C	9-22-37	1685	1352	1269		1211
Penrose	1	F	"	1984	1708	1647		1573
"	3	E	"	Pump				
Walden	4	E	15-22-37		1525	1329		1021

ROWAN OIL CO.

Elliott B-9	3	D	9-22-37	Pump				
Walden	3	C	15-22-37	1649	1515	1303		993
"	6	D	"	1788	1570	1360	1266 1166	1157
Elliott A-15	1	J	"	1284	1082			838

SHELL OIL CO.

Argo A	6	C	22-21-37					2700
Rinewalt	3	F	4-22-37	2194	2069	1997		1905
"	4	C	"	2187	2080	2003	1955 1941	1886
Turner	7	L	22-21-37			2613		2477
"	9	K	"					2571

SINCLAIR OIL & GAS CO.

Brunson	4	O	4-22-37	2195	2086	1998		1855
"	5	J	"	2265	2079	1993		1866
"	8	L	3-22-37	2305	2190	2010		1852

SKELLY OIL CO.

Baker B	14	M	10-22-37			1373		
Stitcher	1	K	4-22-37	2217	2083	2026		1871
"	4	L	"	2217	2089	2034		1878

BRUNSON POOL B.H.P'S CONT'D.

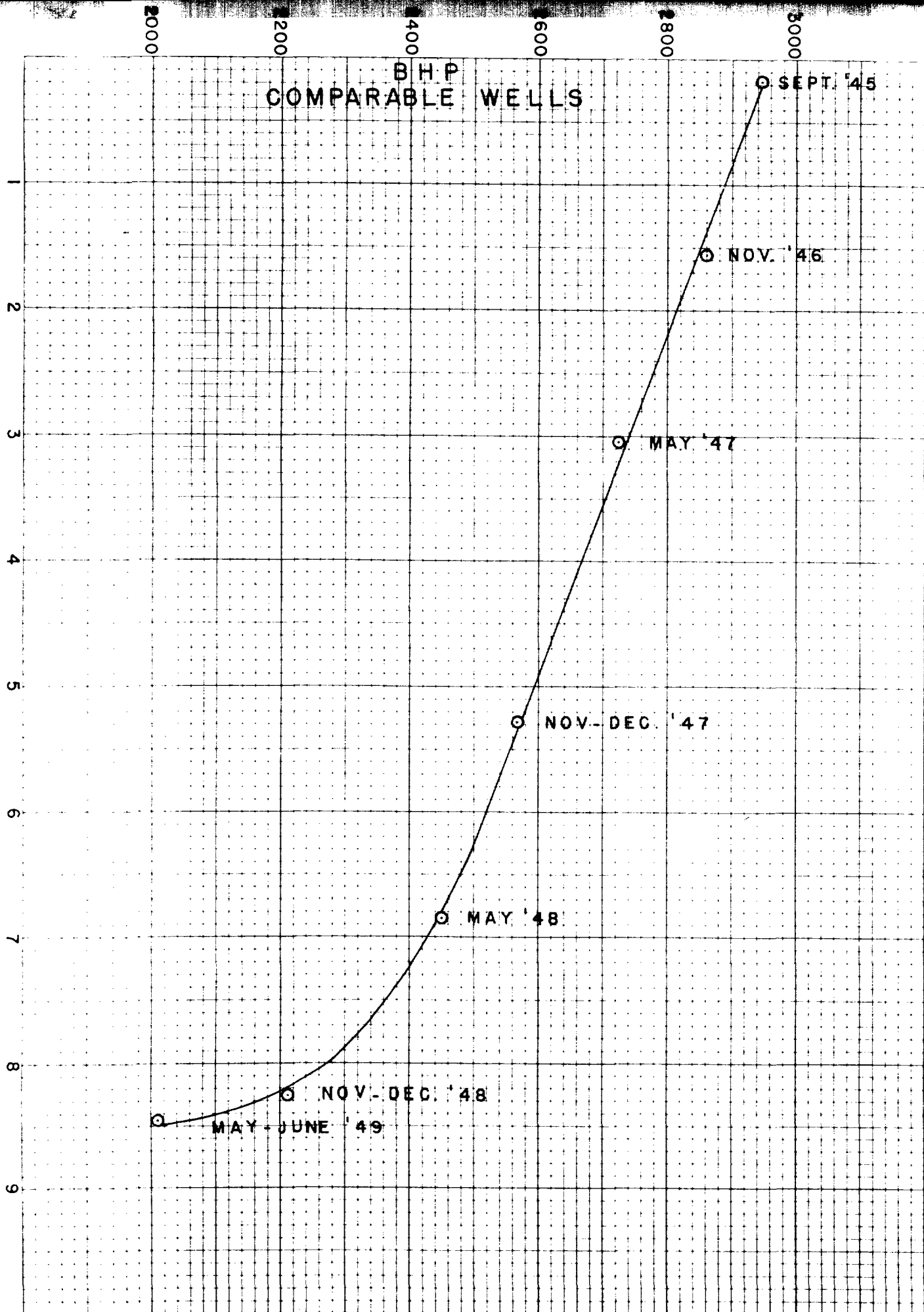
COMPANY	WELL		1949	1949	1950	1950	1950	1950
LEASE	UNIT	S.T.R.	May-June	Nov.-Dec.	1st Feb.	1st Apr.	1st June	1st Aug.
<u>SOUTHERN PET. EXPL. CO.</u>								
Rinewalt	B 1 D	4-22-37	2211	2083	1998			1894
<u>STANOLIND OIL & GAS CO.</u>								
Corrigan	2 I	33-21-37	1948	1778	1782			1767
<u>TIDEWATER ASSOC. OIL CO.</u>								
Brunson	1 P	4-22-37	2254	2158	2037			1995
Clifton	2 M	"	Pump			P. B. To Drinkard		
TOTAL PRESSURES			129330	129714	127839	27023*	26617*	130256
NO. WELLS RUN			64	68	68	15*	15*	72
AVERAGE PRESSURE			2021	1908	1880	1802*	1775*	1809

* Key Well Survey

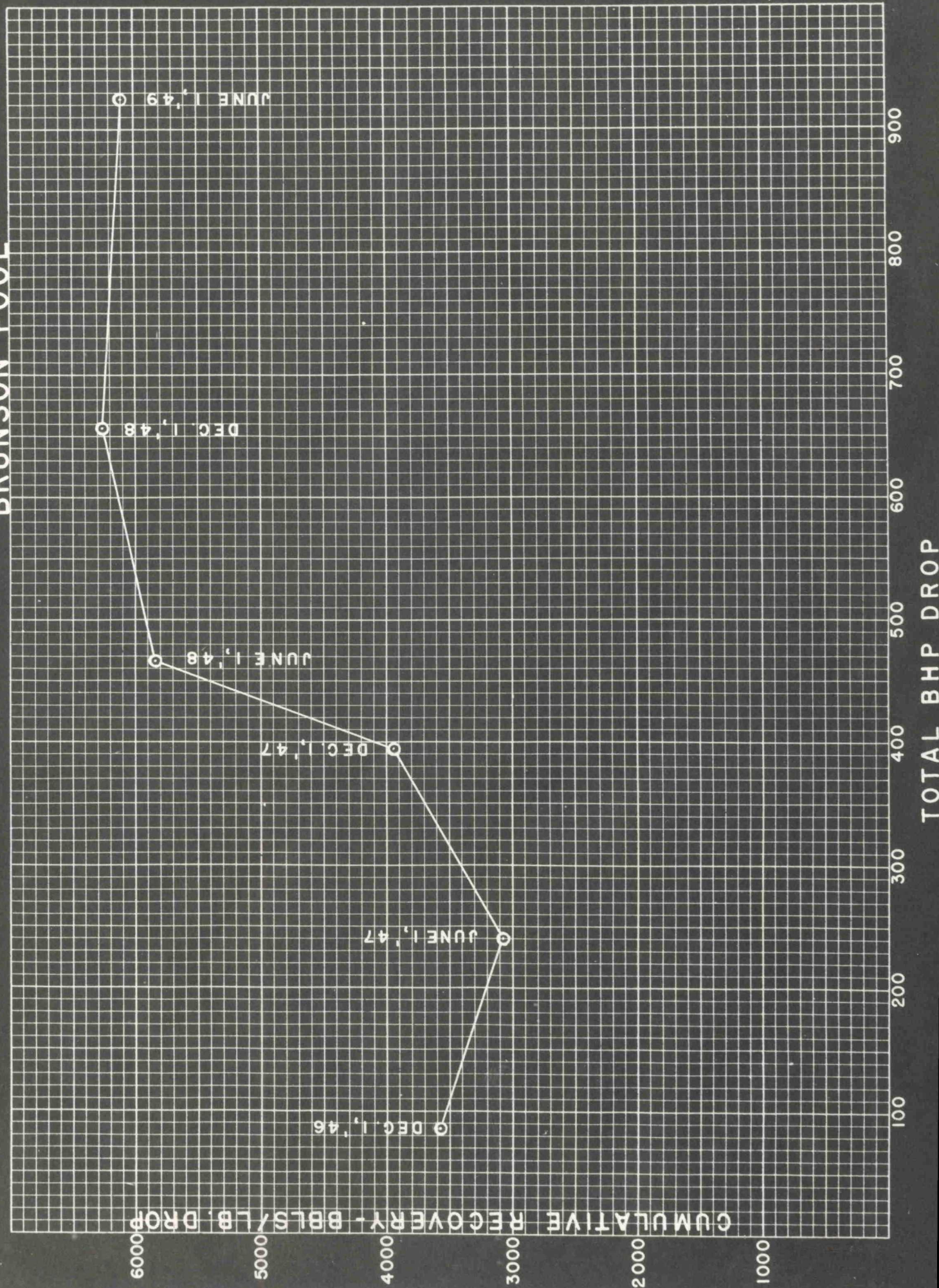
AVERAGE DAILY PROD. RATE - THOUSAND BBLs

B.H.P.
COMPARABLE WELLS

BRUNSON POOL



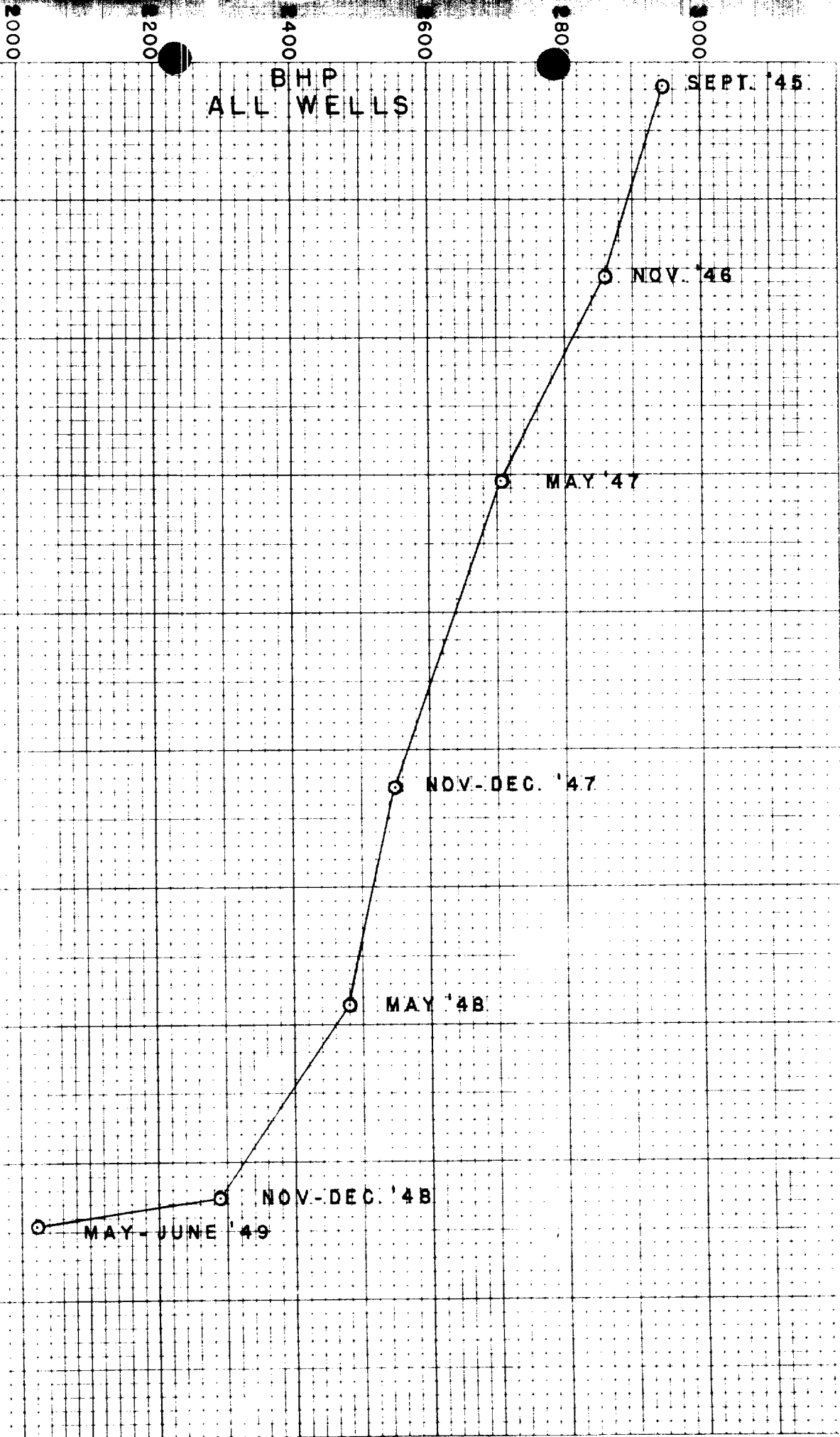
BRUNSON POOL



AVERAGE DAILY PROD. RATE - THOUSAND BBLs.

BHP
ALL WELLS

BRUNSON POOL





UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

P. O. Box 997
Roswell, New Mexico

August 7, 1950

Mr. John E. Cochran, Jr.
Carper Building
Artesia, New Mexico

Re: Lease Las Cruces 028775(b)

Dear Mr. Cochran:

Reference is made to the application of American Republics Corporation which you, as their attorney, stated you submitted to the Oil Conservation Commission of New Mexico for an order granting permission to drill four unorthodox "five spot" well locations in secs. 27 and 35, T. 17 S., R. 29 E., N.M.P.M., Eddy County, New Mexico.

The land involved in the application is embraced in Federal oil and gas lease Las Cruces 028775(b), which is held and operated by American Republics Corporation. The unorthodox well locations set forth in the application are as follows:

Robinson "B"

<u>Well No.</u>	<u>N. of S. line Sec. 27</u>	<u>E. of W. line, Sec. 27</u>
28	1345 feet	2615 feet
	<u>S. of N. line, Sec. 27</u>	<u>W. of E. line, Sec. 27</u>
29	2615 feet	1295 feet
	<u>S. of N. line, Sec. 35</u>	<u>E. of W. line, Sec. 35</u>
30	1295 feet	1345 feet
	<u>S. of N. line, Sec. 27</u>	<u>E. of W. line, Sec. 27</u>
31	2615 feet	2615 feet

Each of the four locations is approximately 25 feet from the boundary of adjoining Federal lease Las Cruces 028775(a) (also held and operated by American Republics Corporation) and is approximately 1295 feet from nearest boundary of any other lease.

Ex. 3

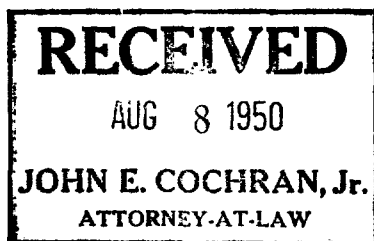
No objection is offered by this office to the well spacing plan providing for drilling of four wells at locations specified in the application to test the producing reservoir of Grayburg-Jackson pool. Drilling of these wells may afford opportunity for additional recovery of oil and gas from the producing reservoir. Approval to drill the wells will be contingent upon approval of the unorthodox locations for proration purposes by the Oil Conservation Commission of the State of New Mexico.

Very truly yours,

Foster Morrell

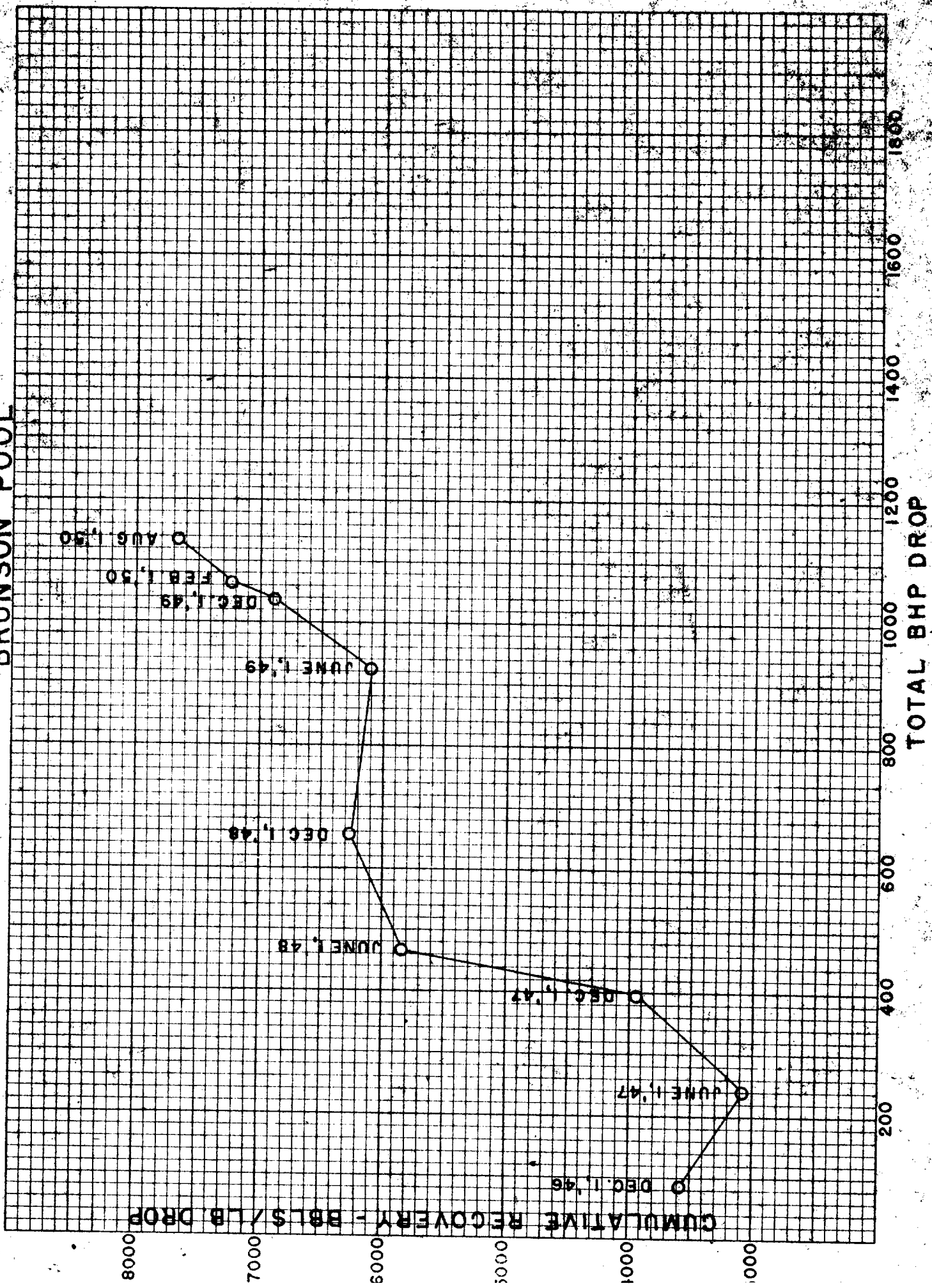
Foster Morrell
Oil and Gas Supervisor
Southwestern Region

cc: Mr. Cochran



Ex #3
Case 202

BRUNSON POOL



Ex #1 Case 202

BRUNSON POOL

PRESSURE-PRODUCTION DATA

Press. Survey	Press. -4300	Wells Bombed	No. Wells in Pool	Prod. Bbls. Period	Prod. Bbls. Cumulative	Press.Drop Period	Press.Drop Cumulative	Bbls/Lb. Period	Drop Cumulative
Sept. 14, 1945	2945	1	1	0	0	0	0	0	0
Dec. 1, 1946	2860	14	15	304,864	304,864	85	85	3,587	3,587
June 1, 1947	2705	25	33	433,641	738,505	155	240	2,798	3,077
Dec. 1, 1947	2551	40	45	812,426	1,550,931	154	394	5,275	3,936
June 1, 1948	2479	51	57	1,169,745	2,720,676	72	466	16,246	5,838
Dec. 1, 1948	2288	56	65	1,398,655	4,119,331	191	657	7,323	6,270
June 1, 1949	2021	64	74	1,520,927	5,640,258	267	924	5,696	6,104
Dec. 1, 1949	1908	68	79	1,507,000	7,147,258	113	1037	13,336	6,892
Feb. 1, 1950	1880	68	79	552,979	7,700,237	28	1065	19,749	7,230
Aug. 1, 1950	1809	72	86	1,007,311	8,707,548	71	1136	14,187	7,665

BRUNSON POOL BOTTOM HOLE PRESSURES
Datum - 4300' Shut-In Time 48 Hours

COMPANY LEASE	WELL UNIT	S.T.R.	1949 May-June	1949 Nov.-Dec.	1950 1st Feb.	1950 1st Apr.	1950 1st June	1950 1st Aug.
<u>AMERADA PET. CORP.</u>								
Corrigan	5 G	4-22-37	1972	1836	1767			1763
"	6 B	"	1950	1699	1582			1765
"	7 H	"	1701	1642				1618
"	11 A	"	2168	2053	1956	1976	1948	1888
Hare	4 N	33-21-37	2175	2061	1962			1905
"	5 K	"	1853	1871	1552	1583	1715	1704
Walden	1 K	15-22-37	1104	862	802	804	744	697
"	3 N	"	1066	872	783			666
"	4 L	"	1208	920	848			709
Wood	5 B	22-22-37	1640	1605	1592			1508
"	6 A	"	1901	1673	1557	1568	1636	1622
<u>CARTER, A. G. FOUNDATION</u>								
Elliott	3 C	22-22-37	490	564				
<u>CITIES SERVICE OIL CO.</u>								
Brunson B	1 I	4-22-37	2229	2101	2044	1971	1926	1874
"	6 M	3-22-37	2398	2292	2140			2121
<u>CONTINENTAL OIL CO.</u>								
Elliott A-15	3 O	15-22-37	1580	1221	1120			1025
"	5 P	"	1381	1169	1260			743
Elliott B-15	2 I	"	1036	925	860			1026
Lockhart A-27	1 E	27-21-37		2727	2640			2524
Wantz E	1 O	21-21-37		2442	2280			
"	2 N	"			2050			
<u>GULF OIL CORP.</u>								
Carson, J.N.	5 J	28-21-37	2630	2471	2413			2307
"	7 B	33-21-37	2426	2278	2190			2078
"	8 O	28-21-37	2645	2474	2404	2373	2348	2295
"	9 K	"	2656	2500	2439			2287
Carson C	5 A	33-21-37	2337	2162	2087			1983
"	6 P	28-21-37	2450	2302	2219			2116
"	8 H	"		2061	2048			1804
Cole A	5 I	16-22-37	1015	898	869			628
"	6 B	"	1241	1157	1502			797
"	7 H	"	1822	1490		1184	1083	963
Eubank	5 B	22-21-37						2720
"	6 G	"						2704
King	7 G	28-21-37	2649	2307	2404			2334
"	10 B	"	2471	2339	2069			2098
"	12 A	"	2573	2474	2383			2253
"	15 F	"		2493	2356	2345	2340	2303
"	17 C	"		2512	2387			2330
"	18 E	"		2480	2252			2121
"	21 H	"						2380
Rinewalt	2 E	4-22-37	2230	2067	2012			1855
Stitcher	2 N	"	2208	2073	1999	1941	1911	1824

BRUNSON POOL B.H.P'S CONT'D.

COMPANY	WELL	1949	1949	1950	1950	1950	1950
LEASE	UNIT	S.T.R.	May-June	Nov.-Dec.	1st Feb.	1st Apr.	1st June
							1st Aug.

HUMBLE OIL & REG. CO.

Ferrel	2	A	22-22-37	2278	Plugged		
Greenwood	8	K	9-22-37	Pump			
"	9	J	"	2069	1955	1850	1826
"	10	P	"	1798	1791	1646	1749
"	12	O	"	1991	1897	1775	
"	13	L	"	Pump			1658
							1626
							1693

MAGNOLIA PET. CO.

Brunson	9	B	9-22-37	2305	2137	2026		1886
"	10	G	"	2117	1968	1877		1743
"	11	A	"	2112	2109	2007	2003	1879
"	16	D	10-22-37		2308	2175	1953	2109
Carson, E.O.	10	F	33-21-37	1411	2545	2383		Pump
"	13	G	"	2267	2079	2016		Pump
"	14	C	"	2573	Pump			
"	16	D	"	2585		2354		Pump
"	17	N	"	2607	2435	2304		2260
"	18	M	28-21-37	2630	2343	2291	2294	2224
"	19	L	"	2615	Pump			2210
Carson, J.N.	2	H	33-21-37	2180	1991	1935	1934	1933
Corrigan	1	O	"	2107	1871	1867		1952
"	4	J	"	2160	1926	1926		1775
"	7	P	"	2037	1839	1807		1826
								1868

OHIO OIL CO.

Warlick	5	P	15-21-37					2697
Marshall	7	D	27-21-37					2426

PENROSE, N. G.

Elliott B-9	4	C	9-22-37	1685	1352	1269		1211
Penrose	1	F	"	1984	1708	1647		1573
"	3	E	"	Pump				
Walden	4	E	15-22-37		1525	1329		1021

ROWAN OIL CO.

Elliott B-9	3	D	9-22-37	Pump				
Walden	3	C	15-22-37	1649	1515	1303		993
"	6	D	"	1788	1570	1360	1266	1157
Elliott A-15	1	J	"	1284	1082		1166	838

SHELL OIL CO.

Argo	6	C	22-21-37					2700
Rinewalt	3	F	4-22-37	2194	2069	1997		1905
"	4	C	"	2187	2080	2003	1955	1886
Turner	7	L	22-21-37			2613	1941	2477
"	9	K	"					2571

SINCLAIR OIL & GAS CO.

Brunson	4	O	4-22-37	2195	2086	1998		1855
"	5	J	"	2165	2079	1993		1866
"	8	L	3-22-37	2305	2190	2010		1852

SKELLY OIL CO.

Baker	14	M	10-22-37			1373		
Stitcher	1	K	4-22-37	2217	2083	2026		1871
"	4	L	"	2217	2089	2034		1878

BRUNSON POOL B.H.P'S CONT'D.

COMPANY	WELL		1949	1949	1950	1950	1950	1950
LEASE	UNIT	S.T.R.	May-June	Nov.-Dec.	1st Feb.	1st Apr.	1st June	1st Aug.

SOUTHERN PET. EXPL. CO.

Rinewalt	B 1 D	4-22-37	2211	2083	1998			1894
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STANOLIND OIL & GAS CO.

Corrigan	2 I	33-21-37	1948	1778	1782			1767
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TIDEWATER ASSOC. OIL CO.

Brunson	1 P	4-22-37	2254	2158	2037			1995
Clifton	2 M	"	Pump			P. B. To Drinkard		

TOTAL PRESSURES			129330	129714	127839	27023*	26617*	130256
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NO. WELLS RUN			64	68	68	15*	15*	72
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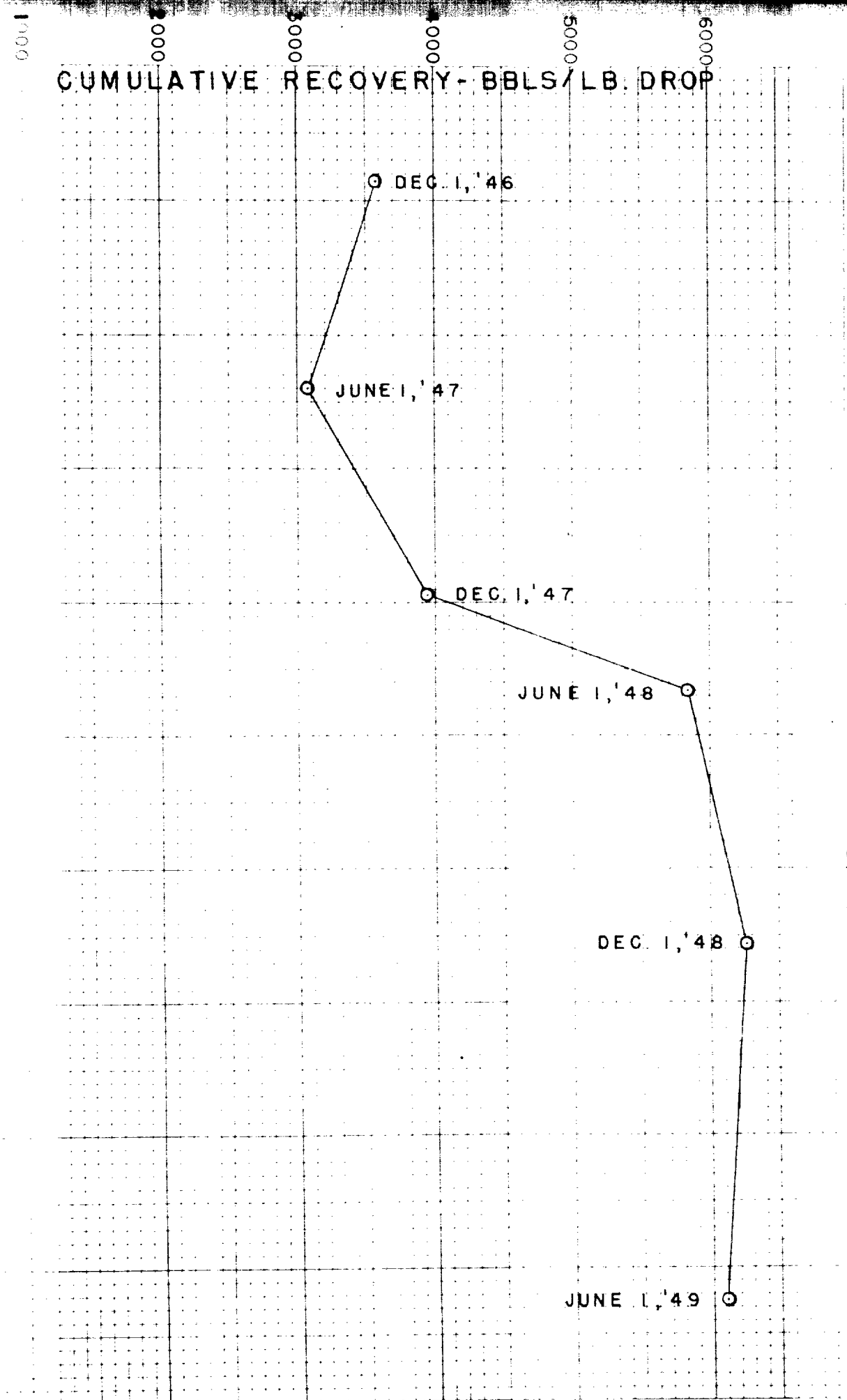
AVERAGE PRESSURE			2021	1908	1880	1802*	1775*	1809
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* Key Well Survey

TOTAL BHP DROP

CUMULATIVE RECOVERY - BBLs/LB. DROP

BRUNSON POOL



CASE 202

Concerning New Mexico Oil Conservation Commission Orders R-4 and R-30 which reduced and continued the reduction of allowable of the Brunson Pool, Lea County, New Mexico.

GENERAL DISCUSSION OF THE BRUNSON POOL

" The Brunson Pool was discovered in September, 1945, when N. G. Penrose completed his Federal Fee Well No. 1 in Section 9, Township 22S, Range 37E, Lea County, New Mexico. Since discovery, a total of 105 producing wells have been drilled in the Brunson Pool. Oil and gas production is obtained from the Ellenburger formation and the various wells produce from intervals between 7300 feet and 8100 feet. To the east, the up-dip limits of the pool have been defined by post-Ellenburger erosion -- which process has caused complete removal of the producing formation along the east edge of the field. To the west, the down-dip limits of the pool are defined by the contact of the bottom water level and the top of the steeply dipping producing sediments. To the south, the limits of the pool are determined by minor cross-faulting and/or by poor reservoir development of porosity and permeability. In these three directions, the pool is considered effectively developed, and about 4100 acres have thus far been proved by development. Current drilling is extending the pool to the north. At present, 94 wells are producing and 11 have either been abandoned, shut down, or plugged back to a shallower pay zone.

" Until July 1, 1951, the Brunson Pool has produced 10,668,780 barrels of oil, 509,351 barrels of water, and 18,841,964 Mcf of gas. The cumulative gas-oil ratio has been 1766 cubic feet per barrel and the cumulative water cut has been 4.6 per cent of total fluids produced. The original bottom hole pressure at 4300 feet subsea was 2945 psi and the average bottom hole pressure measured in April, 1951 was 1797 psi. The saturation pressure has been reported as 2472 psi and the solution gas-oil ratio at this pressure is 1010 cubic feet per barrel.

" It is now obvious that the great bulk of the Brunson Pool is producing under the influence of a dissolved gas drive mechanism, although there may be isolated portions which contain less than 9 per cent of the currently producing wells and probably less than 6 per cent of the acreage which will ultimately become productive, which may behave in a different manner.

DISCUSSION OF THE REDUCTION IN ALLOWABLE EXPERIMENT

" At the end of January, 1950, there were 81 producing wells in the Brunson Pool. These wells had accumulated to this date 7,645,647 barrels of oil, 210,703 barrels of water, and 11,011,273 Mcf of gas. The cumulative gas-oil ratio at this time was 1440 cubic feet per barrel and the cumulative water cut was 2.7 per cent of total fluids produced. The average bottom hole pressure in the pool was 1880 psi which represented a drop of 1065 psi from the original pressure.

" At this time most operators realized that the Brunson Pool was producing under the influence of a dissolved gas drive, which sort of drive is one of the more inefficient types of reservoir recovery mechanisms. Therefore, the operators felt that if another type of reservoir recovery mechanism could be encouraged ultimate oil recovery from the field could be increased. It was believed that if oil production rates were curtailed, edge water or bottom water might be encouraged to encroach into the reservoir in amounts more nearly equal to reservoir withdrawals. Hence, a higher bottom hole pressure would be maintained, gas-oil ratios would be lessened,

wells would flow longer, less gas would break out of solution in the reservoir, operating costs would be reduced, and ultimate recovery would be increased.

" Therefore, at the request of one of the Brunson Pool operators, the per well allowable for the Brunson Pool was reduced from 126 to 90 barrels of oil per day for an experimental period of six months during which time the operators would conduct tests and gather data as to the characteristics of the reservoir. The experimental period commenced February 1, 1950. In order to conduct additional tests and to gather additional data, the Oil Conservation Commission, at the operator's request, ordered the experiment continued for a second six-month period. After this date, the experimental period has been continued about seven more months because of two requests from the operators asking postponement of re-hearing of Case 202. These postponements were asked in order to permit the operators to conduct one more bottom hole pressure survey and to complete their final studies as to the characteristics of the reservoir. On September 1, 1951 the allowable reduction experiment in the Brunson Pool will have lasted 19 months.

" During the experimental period oil, water, and gas production have, of course, been measured each month; four field-wide bottom hole pressure surveys have been conducted; numerous operators' meetings have been held; several sub-committees have been appointed for special study purposes; and the operators are now prepared to present the results of their study to the Oil Conservation Commission and to make their recommendation for the manner of producing the pool in the future.

DISCUSSION OF RESERVOIR MECHANICS

" Attachment A is a composite graph of statistics for the Brunson Pool from first production and until July 1, 1951. Oil production rate, gas-oil ratio, percentage water in total fluids, number of producing wells, arithmetic average bottom hole pressure, and weighted average bottom hole pressure are plotted against cumulative oil production from the entire field. The beginning and end of each year are also shown on the composite graph. The following observations from Graph A are worthy of especial comment:

(1) Oil Production Rate

During January, 1950, the pool produced 254,889 barrels of oil. During February, 1950 (the first month of the allowable reduction experiment), the pool produced 159,336 barrels of oil. Because of subsequent development, the production rate increased to 195,474 barrels of oil in June, 1951. This latter rate is still less than the rate in effect at the beginning of the experiment.

(2) Number of Producing Wells

At the end of January, 1950, there were 81 producing wells in the pool. During the period of the allowable reduction experiment, 20 additional wells were completed and 7 were abandoned or shut down. Hence, 94 wells were producing in June, 1951.

(3) Gas-Oil Ratio

During January, 1950, the field's producing gas-oil ratio was 2078 cubic feet per barrel. After reduction of allowable in the field, the gas-oil ratio commenced to rise at a rate more rapid than before. The reduction in allowable curtailed production from the wells whose capacities

were higher and whose gas-oil ratios were generally lower while the marginal wells whose gas-oil ratios are generally high were not curtailed as much. Hence, a larger percentage of the field's oil was produced by the high gas-oil ratio wells which in turn caused an increase in pool GOR.

(4) Percentage Water in Total Fluid

Water production during January, 1950 amounted to 3.4 per cent of total fluids produced. After reduction in allowable, water production percentage continued to increase at a rate higher than before. During June, 1951, water production in total fluids amounted to 9.8 per cent.

(5) Arithmetic Average Bottom Hole Pressure

The arithmetic average bottom hole pressure of the field continued to decline at an ever decreasing rate. This general flattening of bottom hole pressure trends had been commenced prior to the allowable reduction experiment and continued during the experiment. This behavior of bottom hole pressure trends is because of inclusion of first observed pressures of new wells in the various surveys. For instance, between February, 1950 and April, 1951 the average bottom hole pressure varied from 1880 to 1797 psi while the average first observed pressure from new wells drilled in the northern portion of the field amounted to 2513 psi. The inclusion of five such wells in an arithmetic average of 85 wells would be sufficient to raise the average bottom hole pressure from 1700 psi to 1745 psi. An example of the effect of new wells is noted from comparison of the August, 1950 and April, 1951 surveys. Between the two surveys, the average bottom hole pressure of 68 comparable wells run during each survey declined 133 psi while the average bottom hole pressure of all wells surveyed (72 in August and 82 in April) declined only 12 psi. The error thus introduced by averaging in nearly virgin pressures from new wells amounted to 121 psi between these two surveys.

(6) Weighted Average Bottom Hole Pressure

"A system of weighting the bottom hole pressures for cumulative oil produced at the time of each survey yielded data for the weighted average bottom hole pressure curve. This system resulted in a truer relationship, yet did not completely remove the effect of new wells.

"Graphs B and C are comparable well survey plots which show the bottom hole pressure decline for 19 wells which have been surveyed in all except the first of the eleven pool-wide pressure surveys. As no new wells were included in these two graphs, no weighing procedure was necessary and simple arithmetic average bottom hole pressures were used. A graph of this nature is most valuable for studying reservoir performance. Graph B shows the average pressures of these comparable wells plotted against the cumulative oil production of these wells. This case would apply in a very poorly connected reservoir in which case each well would in a sense drain its own reservoir. Graph C shows the same pressures plotted against the cumulative oil production of the entire pool. This case would apply to very permeable reservoirs in which individual well pressures would reflect field-wide conditions. Observations of bottom hole pressures of newly completed wells in the north end of the field which are always less than original but greater than the then current pressure of older wells indicate conditions at Brunson to be somewhere between those implied by Graphs B and C. However, it should be noted that change in oil production rate at Brunson did not affect the slope of either relationship.

// During June, 1951 which is the most recent month for which production figures are available, the pool produced 195,474 barrels of oil, 21,120 barrels of water, and 551,426 Mcf of gas. The gas-oil ratio during this month was 2821 cubic feet per barrel and the water cut was 9.8 per cent.

(C From Graphs A, B, and C, it is apparent that performance of the Brunson Pool during the period of reduction in allowable experiment may be summarized as follows:

- (1) Oil production rates have been curtailed to amounts varying from 62 per cent to 77 per cent of previous production rates.
- (2) 20 Additional wells have been drilled.
- (3) Percentage water production in total fluids has remained small but has increased during the experiment at rates slightly higher than previously.
- (4) Gas-oil ratios have increased during the experiment at a rate more rapid than before which is partially caused by allowing the higher-gas-oil ratio wells to produce a larger share of the pool's total oil.
- (5) Bottom hole pressure decline trends have not been noticeably affected by the change in oil production rates.

All of these observations are reasonable and are to be expected in dissolved gas drive reservoirs. Apparently there is no large water aquifer in the Ellenburger formation which is in active communication with the Brunson Pool for drastic reduction in producing rates was not able to cause any appreciable movement of this water which could be observed by change in bottom hole pressure trends or any other trends. It is therefore believed, from data thus far accumulated, that the reasonable fluctuations in producing rate, observed in the past, have not affected the ultimate recovery to be expected from the Brunson Pool.

Therefore, the Brunson Pool operators recommend and request that effective September 1, 1951 the allowable reduction experiment at Brunson be ended and that the Brunson Pool be restored to the normal allowable applicable to wells in the 7000 to 8000 depth bracket. The previous depth bracket at Brunson used for allowable purposes prior to the allowable reduction was the 8000 to 9000 foot bracket. However, the Brunson Pool operators respectfully submit the following reasons for using the 7000 to 8000 instead of the 8000 to 9000 foot bracket:

- (1) 62 wells or 66 per cent of the 94 wells currently producing at Brunson have total depths in the 7000 to 8000 foot depth range.
- (2) Allowable production rates commensurate with this depth bracket (currently 122 BOPD) have been observed at Brunson and are known to cause no waste.
- (3) The 7000 to 8000 foot depth bracket is in use at North Brunson and it is felt that because of probable combination of the pools, the allowables in both pools should be identical.

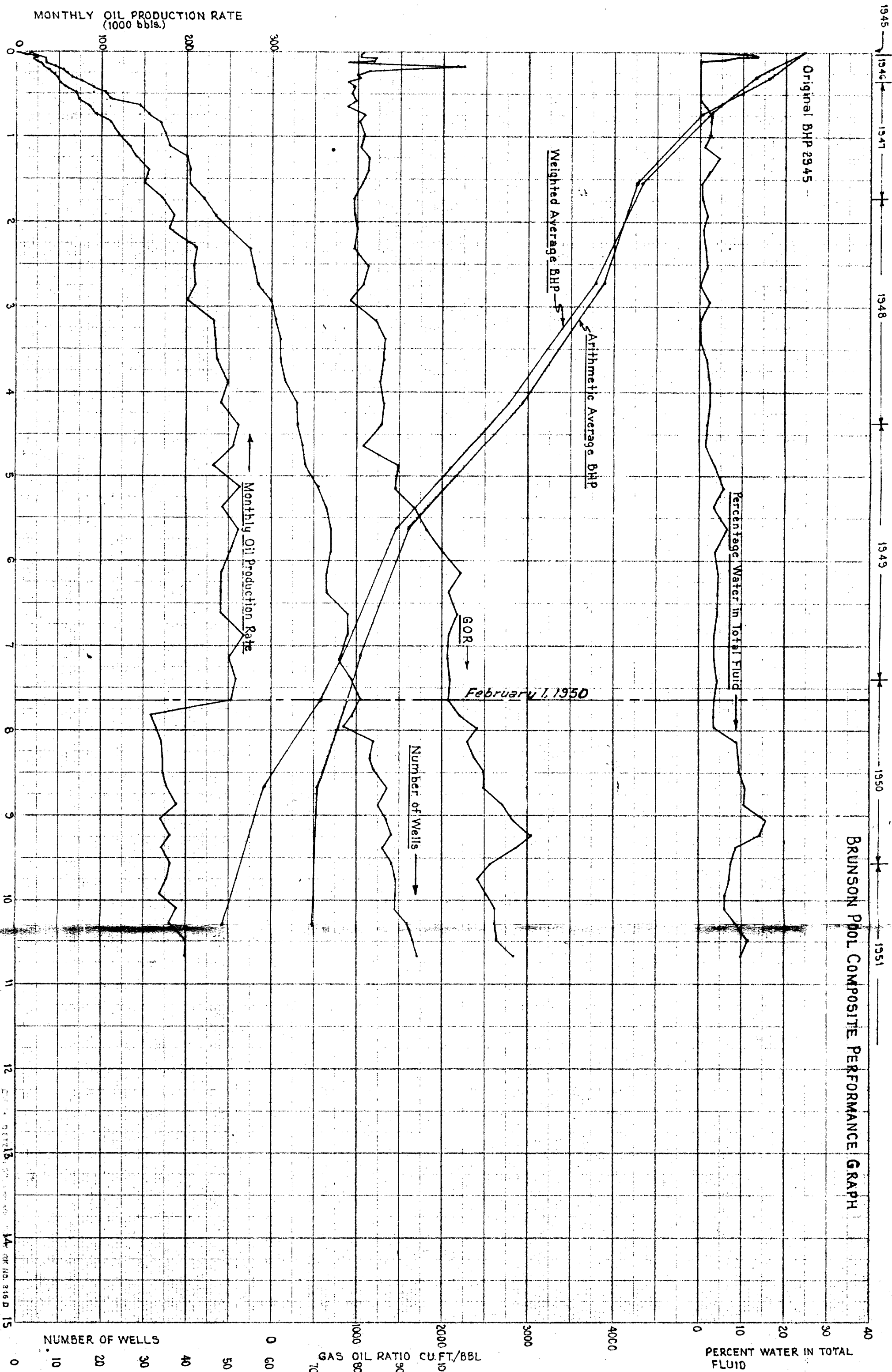
The Brunson Pool operators further recommend and request the Oil Conservation Commission order semi-annual gas-oil ratio surveys in the Brunson Pool during the months of February-March and August-September. These gas-oil ratios are to be filed with the Commission by the 15th of the month following each survey period and used for proration purposes.

AVERAGE BHP AT 4300 FEET SUBSEA (p.s.i)

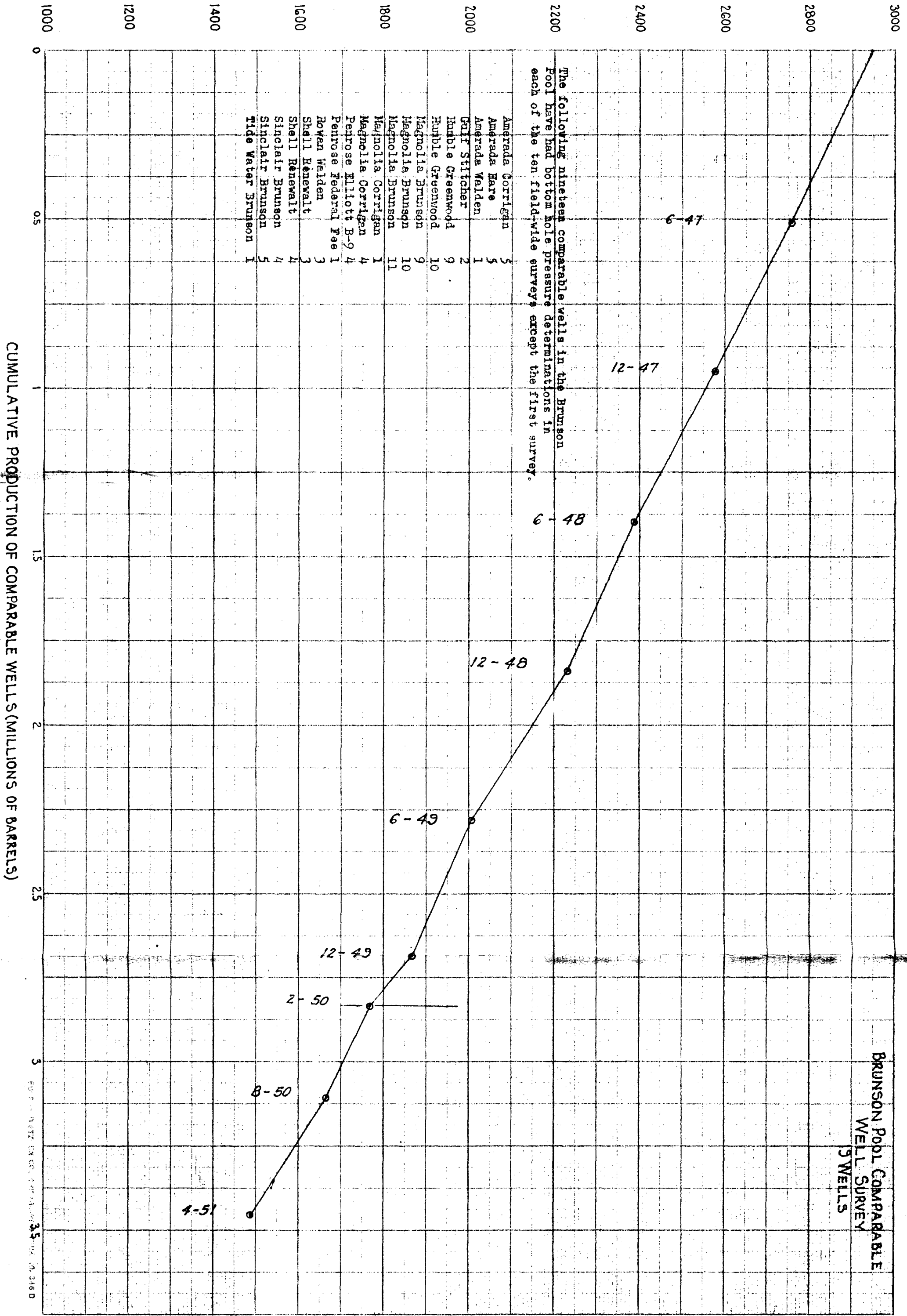
MONTHLY OIL PRODUCTION RATE
(1000 bbls.)

CUMULATIVE OIL PRODUCTION (MILLIONS OF BARRELS)

BRUNSON POOL COMPOSITE PERFORMANCE GRAPH



ARITHMETIC AVERAGE BHP AT 4300 FEET SUBSEA



ARITHMETIC AVERAGE BHP AT 4300 FEET SUBSEA

