

CASE 3058: Application of CITIES
SERVICE OIL CO. to establish a
special GOR limit, Lea County.

CASE No.
3058

Application,
TRANSCRIPTS,
SMALL Exhibits
ETC.

DRAFT

JMD/esr

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 3058

Order No. R- 2725

APPLICATION OF CITIES SERVICE OIL
COMPANY TO ESTABLISH A SPECIAL GOR
LIMIT, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on
May 27, 1964, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.
~~Examiner duly appointed by the Oil Conservation Commission of New~~
~~Mexico, hereinafter referred to as the "Commission," in accordance~~
~~with Rule 1214 of the Commission Rules and Regulations.~~

NOW, on this June day of 1964, the Commission,
a quorum being present, having considered the ~~application, the~~ testimony,
the record, ~~evidence adduced~~ and the recommendations of the Examiner,
and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by
law, the Commission has jurisdiction of this cause and the subject
matter thereof.

(2) That the applicant, Cities Service Oil
Company, seeks the establishment of
a special gas-oil ratio limit of 6000
cubic feet of gas for each barrel of oil
produced in the Reeves - Pennsylvanian
Pool, Lea County, New Mexico.

Pool by permitting the applicant to produce more than its just and equitable share of the oil and gas in the pool.

(6) That the subject application should be denied.

IT IS THEREFORE ORDERED:

(1) That the subject application is hereby denied.

(2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

1964 MAY 6 PM 1:39

BEFORE THE
OIL CONSERVATION COMMISSION OF NEW MEXICO

IN THE MATTER OF THE APPLICATION
OF CITIES SERVICE OIL COMPANY FOR ORDER
ESTABLISHING A GAS-OIL RATIO FOR
THE REEVES-PENNSYLVANIAN POOL, LEA
COUNTY, NEW MEXICO, AS AN EXCEPTION
TO THE PROVISIONS OF RULE 506.

Case 3058

A P P L I C A T I O N

Comes now Cities Service Oil Company and applies to the Oil Conservation Commission of New Mexico for an order setting the limiting gas-oil ratio for the Reeves-Pennsylvanian Pool, Lea County, New Mexico, at 6,000 cubic feet of gas for each barrel of oil produced, as an exception to the provisions of Rule 506 of the Rules and Regulations of the Oil Conservation Commission, and in support thereof would show the Commission:

Applicant is the owner and operator of wells in the Reeves-Pennsylvanian Pool, as presently defined by the Commission. In the interests of more efficient and economical operation of wells in the pool, the proposed limiting gas-oil ratio of 6,000 to one should be adopted for this pool, and the adoption of such ratio will be in the interests of conservation, resulting in a greater ultimate recovery of oil from the pool, and will prevent waste.

WHEREFORE, applicant prays that the Commission set this application for hearing before its duly appointed examiner on May 27, 1964, or such other date as may be designated by the Commission, and that after notice and hearing as required by law,

DOCKET MAILED

Date 5-15-64
Q

the Commission enter its order granting the relief prayed for herein.

Respectfully submitted,
CITIES SERVICE OIL COMPANY

By Jason W. Kellahin
KELLAHIN & FOX
P. O. Box 1769
Santa Fe, New Mexico

ATTORNEYS FOR APPLICANT

5-22-64

Jerry Lossee
John Dugg will oppose 3058
BOX 239, Artesia

Kellahin and Lossee have stipulated
that case may be called after-noon.

Case 2964
2164 denied
2395 ✓

CLASS OF SERVICE
This is a fast message
unless its deferred char-
acter is indicated by the
proper symbol.

WESTERN UNION TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (4-60)

SYMBOLS
DL=Day Letter
NL=Night Letter
LT=International
Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

LA059 SSG133

L RWA061 PD=ROSWELL NMEX 25 1131A MST=

OIL CONSERVATION COMMISSION=

STATE LAND OFFICE BLDG ATTN A L PORTER JR
SANTA FE NMEX=

RE: EXAMINER HEARING MAY 27, 1964, CASE NO. 3058 GULF
OIL CORPORATION CONCURS WITH CITIES SERVICE OIL COMP Y
IN THEIR APPLICATION TO INCREASE THE GAS OIL RATIO TO
6,000 IN THE REEVES PENNSYLVANIAN POOL, LEA COUNTY=
GULF OIL CORP M I TAYLOR=

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE
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LA109 DB350

D MDA138 PD 2 EXTRA=FAX MIDLAND TEX 25 408P CST=

OIL CONSERVATION COMMISSION=

SANTA FE NMEX=

THE SUPERIOR OIL COMPANY SUPPORTS THE APPLICATION OF
CITIES SERVICE OIL COMPANY CONCERNING THE REEVES PENN
FIELD, LEA COUNTY, NEW MEXICO, CASE NUMBER 3058 HEARING
TO BE HELD MAY 27, 1964=

THE SUPERIOR OIL COMPANY D H COLLINS JR
DISTRICT ENGINEER==

3058 27 1964=

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

DOCKET: EXAMINER HEARING - WEDNESDAY - MAY 27, 1964

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

The following cases will be heard before Elvis A. Utz, Examiner, or Daniel S. Nutter, Alternate Examiner:

- CASE 3033:** (Continued from April 29, 1964 Examiner Hearing)
Application of Cherry Brothers and Cabot Corporation for the creation of a new oil pool and for special temporary pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new oil pool for Lower Wolfcamp production for its Austin State Well No. 1, located in Unit F of Section 19, Township 14 South, Range 36 East, Lea County, New Mexico, and for the establishment of temporary pool rules therefor, including a provision for 80-acre oil proration units.
- CASE 3046:** Application of Marathon Oil Company for a triple completion and a non-standard oil proration unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the triple completion (tubingless) of its State Warn A/c 1 Well No. 3, located in Unit F of Section 31, Township 17 South, Range 35 East, to produce oil from the Glorieta, Wolfcamp, and Abo formations, Vacuum Field, Lea County, New Mexico. Applicant further seeks the approval of a non-standard 80-acre proration unit comprising the SE/4 NW/4 and NE/4 SW/4 of said Section 31 to be dedicated to the aforesaid Wolfcamp and Abo zones in said well.
- CASE 3047:** Application of El Paso Natural Gas Company for three non-standard gas proration units and one unorthodox well location, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks the approval of the following three non-standard gas proration units:
A 376.88-acre unit comprising the SE/4 and E/2 SW/4 and Lots 1, 2 and 3 of Section 9 and Lots 3 and 4 and the NW/4 SW/4 of Section 10;
A 357.84-acre unit comprising the SE/4, S/2 SW/4, and NE/4 SW/4 and Lots 1 and 2 of Section 10 and Lots 3 and 4 of Section 11;
A 359.20-acre unit comprising the S/2 and Lots 1 and 2 of Section 11, all in Township 32 North, Range 7 West, Blanco Mesaverde Pool, San Juan County, New Mexico. Applicant further seeks the approval of an unorthodox location for a well to be dually completed in the Mesaverde and Dakota formations at a point 1650 feet from the South line and 825 feet from the East line of said Section 9.
- CASE 3048:** Application of E. L. Fundginsland for compulsory pooling, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an order force-pooling all mineral interests in the Basin Dakota Gas Pool underlying the S/2 of Section 3, Township 29 North, Range 13 West, San Juan County, New Mexico.
- CASE 3049:** Application of Sohio Petroleum Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Littman San Andres Unit Area comprising 661 acres, more or less, of State and Federal lands in Sections 8, 9, 16, and 17, Township 21 South, Range 38 East, Lea County, New Mexico. The Unit Area also includes 1280 acres of fee land in Sections 5, 6, 7, 14, and 15, Block A-29, PSL, Andrews County, Texas.

- CASE 3050:** Application of Sohio Petroleum Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in the Littman-San Andres Pool by the injection of water into the San Andres formation through 4 wells in Sections 8, 9 and 16, Township 21 South, Range 38 East, Lea County, New Mexico. Said project is to be operated in Lea County, New Mexico. Said project is to be operated in conjunction with applicant's proposed waterflood project in the Littman San Andres Unit in Andrews County, Texas.
- CASE 3051:** Application of Pan American Petroleum Corporation to amend Order No. R-2026, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks amendment of Rules 7 and 10 of Order No. R-2026 to permit the production of more than two times top allowable from wells in its Northeast Hogback Unit Pressure Maintenance Project even though they offset wells outside the project area.
- CASE 3052:** Application of The Atlantic Refining Company to amend Order No. R-2210, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks amendment of Rules 7 and 10 of Order No. R-2210 to permit the production of more than two times top allowable from wells in its Horseshoe Gallup Unit Pressure Maintenance Project even though they offset wells outside the project area.
- CASE 3053:** Application of Texaco Inc. for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in the Maljamar Pool by the injection of water into the Grayburg-San Andres formation through two wells located in Section 12, Township 17 South, Range 32 East, Lea County, New Mexico.
- CASE 3055:** Application of Texas Pacific Oil Company for a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the dual completion (conventional) of its J. P. Collier Well No. 1 located in Unit F of Section 10, Township 11 South, Range 33 East, Lea County, New Mexico, to produce oil from the North Bagley Upper and Lower Pennsylvanian Pools through parallel strings of tubing.
- CASE 3056:** Application of Texas Pacific Oil Company for a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the dual completion (conventional) of its State "AF" Well No. 3, located in Unit L of Section 8, Township 18 South, Range 35 East, Lea County, New Mexico, to produce oil from the Abo and Wolfcamp formations, Vacuum Field, through parallel strings of tubing.
- CASE 3057:** Application of Charles O. Trimble for an oil treating plant permit, Lea County, New Mexico. Charles O. Trimble, dba Trimble Mud Service, in the above-styled cause, seeks authority pursuant to Rule 312 to install and operate an oil treating plant approximately one mile South and West of Eunice, New Mexico, for the purpose of processing and treating sediment oil.
- CASE 3058:** Application of Cities Service Oil Company to establish a special GOR limit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the establishment of a special gas-oil ratio limit of 6000 cubic feet of gas for each barrel of oil produced in the Reeves-Pennsylvanian Pool, Lea County, New Mexico.

- 3 - Wednesday, May 27 Examiner Hearing

CASE 3059: Application of Frank Darden for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Cowntown Unit Area comprising 280 acres, more or less, of State land in Sections 13 and 24, Township 18 South, Range 28 East, Eddy County, New Mexico.

CASE 3060: Application of Frank Darden for a waterflood, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in the Artesia Pool in his Cowntown Unit Area, by the injection of water into the Grayburg formation through two injection wells in Sections 13 and 24, Township 18 South, Range 28 East, Eddy County, New Mexico.

CASE 3061: Application of Kewanee Oil Company for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in the Dayton Grayburg Pool by the injection of water into the Grayburg formation through one well in Section 25, Township 18 South, Range 26 East, Eddy County, New Mexico.

CASE 3062: Application of Kewanee Oil Company for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in the Atoka Grayburg Pool by the injection of water into the Grayburg formation through one well in Section 13, Township 18 South, Range 26 East, Eddy County, New Mexico.

Case 3058

Heard 8-27-64

Rec. 6-2-64

1. Recommend denial of this case for increased SOR to 6000:1 in Revere-Penn Oil Pool.

2. Findings:

a) Failed to show waste would be prevented or that correlative rights would be protected.

3. Only showing made was that more oil would be recovered from the pool than the O. Ser. - State BX #1 and then in a lesser period of time.

Thos. A. McF.

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 3058
Order No. R-2725

APPLICATION OF CITIES SERVICE OIL
COMPANY TO ESTABLISH A SPECIAL GOR
LIMIT, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on May 27, 1964, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 18th day of June, 1964, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Cities Service Oil Company, seeks the establishment of a special gas-oil ratio limit of 6000 cubic feet of gas for each barrel of oil produced in the Reeves-Pennsylvanian Pool, Lea County, New Mexico.

(3) That the applicant has not established that waste is occurring or that correlative rights are being violated under the present GOR limit of 2000 cubic feet of gas for each barrel of oil produced in the Reeves-Pennsylvanian Pool.

(4) That the applicant has not established that approval of the subject application will prevent waste or protect correlative rights.

-2-

CASE No. 3058

Order No. R-2725

(5) That approval of the subject application would violate the correlative rights of other operators in the Reeves-Pennsylvanian Pool by permitting the applicant to produce more than its just and equitable share of the oil and gas in the pool.

(6) That the subject application should be denied.

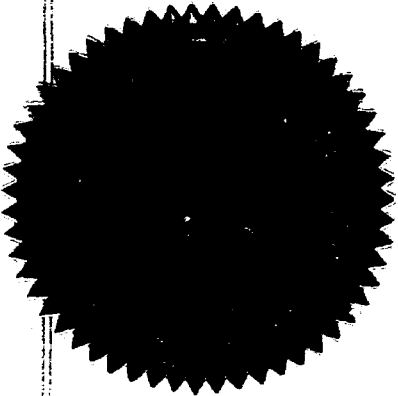
IT IS THEREFORE ORDERED:

(1) That the subject application is hereby denied.

(2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION



Jack M Campbell

JACK M. CAMPBELL, Chairman

E. S. Walker
E. S. WALKER, Member

A. L. Porter, Jr.
A. L. PORTER, Jr., Member & Secretary

esr/

GOVERNOR
JACK M. CAMPBELL
CHAIRMAN

State of New Mexico
Oil Conservation Commission



LAND COMMISSIONER
E. S. JOHNNY WALKER
MEMBER

P. O. BOX 871
SANTA FE

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

June 19, 1964

Mr. Jason Kellahin
Kellahin & Fox
Attorneys at Law
Post Office Box 1769
Santa Fe, New Mexico

Re: Case No. 3058
Order No. R-2725
Applicant:
Cities Service Oil Company

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A handwritten signature in cursive script that reads "A. L. Porter, Jr.".

A. L. PORTER, Jr.
Secretary-Director

ir/

Carbon copy of order also sent to:

Hobbs OCC x

Artesia OCC

Astec OCC

OTHER Mr. Jerry Losee

CITIES SERVICE OIL COMPANY
STATE "AX" #1
REEVES PENN POOL-LEA CO., N.M.
INCOME COMPARISON - 2000 VS 6000 GOR LIMIT

3058

Present work

2000 GOR LIMIT		Gas	Investment	Operating	Net Cash	P.W.
Year	Oil Production Bbls	Production MCF		Expense	Production	Net Cash Production
1964	12,876	121,094		\$ 1,250	\$ 20,696	\$ 20,086
1965	12,479	137,428		1,500	20,499	18,737
1966	11,745	139,074		1,500	19,532	16,812
1967	10,277	127,701		1,500	17,171	13,920
1968	10,277	131,457		1,500	17,290	13,193
1969	10,277	133,309		1,500	17,334	12,462
1970	10,277	133,309		1,500	17,334	11,737
1971	10,277	130,956	\$20,000	3,600	-2,249	-1,432
1972	10,888	134,231		3,600	17,491	10,505
1973	11,316	129,582		3,600	17,948	10,151
1974	12,820	128,689		3,600	19,997	10,652
1975	11,011	94,970		3,600	16,507	8,281
1976	8,319	62,023		3,600	11,822	5,583
1977	6,362	41,854		3,600	8,524	3,791
1978	4,894	29,094		3,600	6,121	2,563
1979	3,756	20,316		3,600	4,126	1,627
1980	2,659	13,174		1,800	13,128	4,878
TOTALS	160,510	1,708,261	\$20,000	\$44,450	\$243,261	\$163,546

6000 GOR LIMIT						
Year	Oil Production Bbls	Gas Production MCF	Investment	Operating Expense	Net Cash Production	P.W. Net Cash Production
1964	36,966	384,011		1,250	61,702	59,888
1965	31,172	398,727		1,500	54,005	49,365
1966	23,988	309,202	20,000	3,600	21,973	18,914
1967	18,265	215,873		3,600	30,124	24,429
1968	14,003	143,042		3,600	22,095	16,869
1969	10,715	93,327		3,600	16,090	11,568
1970	8,219	61,853		3,600	11,721	7,936
1971	6,271	41,313		3,600	8,425	5,371
1972	4,810	28,602		3,600	6,032	3,622
1973	3,714	20,344		3,600	4,081	2,307
1974	2,387	11,967		1,800	12,674	6,752
TOTALS	160,510	1,708,261	\$20,000	\$33,350	\$248,922	\$207,021

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico

May 27, 1964

EXAMINER HEARING

IN THE MATTER OF:

Application of Cities Service Oil Company
to establish a special GOR limit, Lea
County, New Mexico. Applicant, in the
above-styled cause, seeks the establish-
ment of a special gas-oil ratio limit of
6000 cubic feet of gas for each barrel
of oil produced in the Reeves-
Pennsylvanian Pool, Lea County, New
Mexico.

Case No. 3058

BEFORE: Elvis A. Utz

TRANSCRIPT OF HEARING

DEARNLEY-MEIER REPORTING SERVICE, Inc.

FARMINGTON, N. M.
PHONE 325-1182

SANTA FE, N. M.
PHONE 933-3971

ALBUQUERQUE, N. M.
PHONE 243-6691

Table No. 3

Cities Service Petroleum Company
State AX No. 1, Reeves Penn Pool
Lea County, New Mexico

Differential Vaporization Data at 168 °F.

Pressure psig	Relative Volume of Oil Referred to Re- sidual Oil at 168°F.	Relative Volume of Oil Referred to Re- sidual Oil at 60°F.	Solution GOR, SCF per Barrel of Re- sidual Oil at 168°F.	Solution GOR, SCF per Barrel of Re- sidual Oil at 60°F.	Oil Viscosity cp.	Oil Density gm/cc
4561 4555	1.4152	1.4906			0.49	0.6854
4213 4270	1.4196	1.4953			0.47	0.6832
3873 3865	1.4264	1.5024			0.45	0.6800
3513 3500	1.4332	1.5096			0.45	0.6767
3123 3115	1.4410	1.5177			0.44	0.6731
2773 2780	1.4478	1.5250			0.43	0.6699
2458 2445	1.4554	1.5329			0.42	0.6664
2303 2290 (BPP)	1.4592	1.5370	840	887	0.42	0.6647
1893 1880	1.3962	1.4705	700	739	0.46	0.6751
1558 1545	1.3642	1.4369	620	654	0.48	0.6809
1073 1060	1.2911	1.3600	474	500	0.55	0.7003
553 540	1.2156	1.2804	318	336	0.67	0.7189
298 285	1.1737	1.2363	233	246	0.75	0.7287
158 145	1.1407	1.2015	178	188	0.82	0.7371
100 87	1.1109	1.1701	138	146	0.87	0.7458
.0	1.0000	1.0533	0.0	0.0	1.19	0.7696

CITIES SERVICE OIL COMPANY
STATE "AX" #1
REEVES PENN POOL-LEA CO., N.M.
INCOME COMPARISON - 2000 VS 6000 GOR LIMIT

<u>2000 GOR LIMIT</u>						
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I N D E XWITNESSPAGE

E. F. MOTTER

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JACK R. McGRAW

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Cross Examination by Mr. Durrett	40
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Cross Examination by Mr. Utz	45

DEARNLEY-MEIER REPORTING SERVICE, Inc.

FARMINGTON, N. M.
PHONE 325-1182SANTA FE, N. M.
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 PHONE 243-6691

MR. UTZ: Case 3058.

MR. DURRETT: Application of Cities Service Oil Company to establish a special GOR limit, Lea County, New Mexico.

MR. KELLAHIN: Jason Kellahin, Kellahin and Fox, Santa Fe, representing the Applicant. We have one witness.
 (Witness sworn.)

E. F. MOTTER

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A E. F. Motter.

Q By whom are you employed and what position?

A Cities Service Oil Company, Division Petroleum Engineer

of the Texas-New Mexico Division.

Q Have you ever testified before the Oil Conservation Commission and made your qualifications a matter of record?

A Yes.

MR. KELLAHIN: Are the witness' qualifications acceptable?

MR. UTZ: Yes, sir, they are.

Q (By Mr. Kellahin) Are you familiar with the application of Cities Service Oil Company in Case No. 3058 presently before the Examiner?



DEARNLEY-MEIER REPORTING SERVICE, Inc.

FARMINGTON, N. M.
PHONE 325-1182

SANTA FE, N. M.
PHONE 983-3971

ALBUQUERQUE, N. M.
PHONE 243-6691

A Yes, I am.

MR. KELLAHIN: At this time I would like to state that while it was not advertised in this fashion, Cities Service is actually asking for a temporary order for a period of one year, rather than for a permanent order. I think that restricts the scope of the application rather than expands it, and would be proper at this time.

Q (By Mr. Kellahin) Would you state briefly what is proposed by Cities Service in this application?

A Yes. After much study and consideration, we believe that the reservoir energy in the Reeves-Pennsylvanian Pool can be put to somewhat better use by 6,000 to 1 ratio, rather than continuing under the present 2,000 to 1 ratio.

Q Would you briefly review the history of the development of the Reeves-Pennsylvanian Pool?

A Yes, sir. This pool was discovered in November, 1956, by the drilling of Cities Service State "AX" No. 1, which produces from the Strawn lime of the Pennsylvanian Age, a depth of 10,950 foot. It's a structure type trap. The gravity oil is 45 degrees.

Nine wells have been drilled in the immediate area; four of them have produced 745,023 barrels to January 1st, 1964; three wells continue to produce in this pool at the present time. They are the Cities Service State "AX" No. 1, which has produced 383,656 barrels to January 1st, 1964; the John Trigg Federal "J" No. 1, which



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has produced 281,643 barrels to January 1st, 1964; and the Continental State "EK" No. 1, which has produced 22,540 barrels to January 1st, 1964; and the C. W. Trainer Reeves No. 1, which is no longer producing but did produce 57,184 barrels.

All three of the present wells are currently producing or flowing. Bottom hole pressures indicate that two wells are very definitely in the same reservoir, and we have some reservations about the Continental well in that the bottom hole pressures have lagged some 600 to 1,000 pounds behind the rest of the field whenever pressures were run.

The original bottom hole pressure was 4,650 pounds. The latest we have is 1440. Saturation pressure was 2950.

Q Is there any separation, in your opinion, between the Continental well and the other two wells in the reservoir?

A Like I said previously, I have reservations, due to this pressure difference. It could be somewhat of a permeability block between the Trigg well and the Continental well, in that this Trigg No. 2 well did not produce from the Strawn section, although it did have four foot of pay.

The Trainer well, I might also add, while it was producing, and I think one pressure was run on it, was in the same range as the Continental well as far as pressure is concerned.

(Whereupon, Applicant's Exhibits Nos. 1 through 11 marked for identification.)



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Q Referring to what has been marked as Exhibit No. 1, would you identify that and discuss the information shown on it?

A Yes, this is a structure map contoured on top of the Pennsylvanian sand log porosity, and this is the pay sand of the Strawn. We have circled in red the present Penn producers, and green the present Devonian producer, and further red circles around the Trainer well which was abandoned. This contour on top of the pay sand indicates that there is a downdip to the north with approximately 80 foot of relief -- about 70 feet of relief, excuse me, between the Cities Service well and the Continental. This will be borne out further on a cross section.

Also on this exhibit we have the trace of the cross section struck in blue, which runs from A to A prime. This shows the location of the other wells which have penetrated the Strawn sand. It gives their thickness and also the test that was in that particular zone, whether it produced oil or whether it produced anything on a drill stem test.

Q Referring to what has been marked as Cities Service Exhibit No. 2, would you identify that exhibit and discuss it, please?

A Yes, sir. This is an isopac map on the Reeves-Penn Pool, contoured on a thickness of the Pennsylvanian sand log porosity of the Strawn. It indicates that the three wells still producing, Cities Service well has 11 foot of pay, the Trigg well 10, and the



Continental well nine. The Trigg dry hole between the Trigg No. 1-J and Continental's well had approximately four foot of pay.

Q That was not effective pay, though, was it?

A Well, they recovered drilling mud, did not make a well in that particular zone. That well is a Devonian producer at the present time.

Q You have referred to a cross section. Would you identify Exhibit No. 3 and discuss what is shown on that exhibit?

A Under 3 is a cross section beginning at the south with the Continental --it's labelled John Kelly; however, it is now Continental's well -- to the Trigg No. 2, which is a Devonian well, to the Trigg No. Federal "J" No. 1 and the Cities Service State "AX" No. 1.

This I believe shows fairly well the amount of relief in the area. We have selected a datum here at minus 7,000 foot, the approximate depth of the pay sand. If you will notice, the Cities Service is somewhat lower than the Continental well or the Trigg "J" No. 2. We have outlined or marked in red the pay interval as picked from the logs.

Q Have you made a study of the production and GOR curves characteristic of these wells?

A Yes, sir, we have.

Q And you have a curve showing this?

A Yes. Exhibit No. 4 is a producing history of the Cities

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Service Oil Company State "AX" No. 1. We have plotted on this curve the monthly oil production by years and the gas-oil ratio -- well, actually it's plotted by months. It indicates that we've had an increasing GOR, and as the production curve reflects, we've had a GOR penalty inflicted which has caused this producing rate to go down.

If I may, I would like to go on to the other three producing wells in here and come back to this later on.

Q Refer then to Exhibits 5 and 6 and discuss those, please.

A Exhibit 5 is John Trigg Federal "J" No. 1, which again gives the same story on the Cities Service well, in that the increasing GOR has inflicted a penalty, which has, of course, affected their producing rate.

Exhibit 6 is Continental State "W". I think I referred to that as to the Kelly designation before, but it should be the Continental State 6 No. 1. This well had some fairly high ratios and the producing rate has not been good; in fact, the last few months it has averaged about 250 barrels a month or some eight barrels a day.

If we may go back to the Cities Service Curve No. 4 and perhaps also the Trigg curve, we have some things I would like to point out about this curve as one of our reasons for asking for this hearing. I think perhaps the most, the first one that we can point out is that in April of 1962 when the GOR test was run, Cities



Service had about a 32, 3300 GOR -- I would have to check, but just reading from the curve it's approximately 3200.

Now this GOR holds throughout the year in maintaining the allowable for the well. At this lower rate, this well would have been penalized approximately about 60 percent of top allowable at that GOR. You'll note that the sales GOR was far in excess of that measured GOR.

Now that GOR was run with the well being close to top allowable. Again in 1963, we ran our GOR test with the well producing. In April, '62 our test was based on 180 barrels of oil with a resulting GOR of 3231. In April, '63, realizing we probably had a penalty, we didn't produce the well quite as high. We produced it at a high rate of 120 barrels a day with resulting 5967 GOR. You can see that the sales GOR at the low producing rate was in excess of this.

In fact, I would like to read the ratios for the months, bearing in mind that the test ratio on the higher was 5967. But in January -- I'll round these off -- 5800; February, 7300; 7,000; 9,000; 7600; 8700; 6800; 9700; 7300; and 6400.

Now the latter part of 1963 we began to make a study of the reservoir and actually ran some tests and produced this well at higher rates, and we found that due to our suspicion that perhaps we were not, we had a lot of free gas breaking out of solution and it was not pushing the oil forward; and I had some tests made this

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year that more or less, we feel, bear this out. In mid-March we produced the well at 124 barrels a day. The ratio was reduced to 3200 pounds. We also ran the tests to determine the flowing pressure of the well. The flowing tubing pressure was 435 pounds. In April this was -- in May when we ran our GOR survey, we produced the well on May the 6th at 117 barrels for a ratio of 6218, flowing tubing pressure of 425.

The next day we increased this to 149.7 barrels of oil, for a resulting GOR of 5500. The flowing tubing pressure only dropped to 400 pounds. This we think is an indication that we're not utilizing the energy, that gas is breaking out of solution, going into the voidage of the reservoir that has been voided by the oil removal; and the gas being freer to move because of its permeability at the lower rate is escaping ahead of the oil.

Q Is that then, in your opinion, a less efficient use of the reservoir energy than would be achieved by a higher producing rate?

A Yes, I think so. I think a higher producing rate would perhaps eliminate some of this; for how long, I would not say.

Q Would that result in the recovery of oil that would not otherwise be recovered, if that were true?

A Perhaps, to some extent.

Q Referring to Exhibit 7, would you identify that and discuss it, please?



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A Yes. This is just a portion of the bottom hole fluid analysis that our company made on this well. This is tabulated data from which all the curves are made, and I saw no need of adding additional curves. This is the data that is normally used.

I might point out one thing, that the bottom hole pressure sample was run at 2290, and with the saturation, we believe, being at 2950. The data in so far as solution GOR and cubic feet per barrel is only given from that producing pressure on down, because, well, there's just no use of giving it on back; I didn't see any need of it.

I would like to point out at the time of sampling we had difficulty in conditioning the well to single state flow, which more or less confirms that the saturation pressure was above this or at 2950.

Q Referring to what has been marked as Exhibit No. 8, would you identify that exhibit and discuss it?

A Yes, this is a KGKO curve that has been constructed to make the predictions which we will come up with further on other exhibits. This shows a black line that indicates the present performance and the dotted line that has been put in for future reference; and also what we have based our calculations on. I would like to say that this dotted line has been taken from an average of West Texas reservoirs of similar nature and, of course, some assumption has to be made, although I will say that in our



material balance calculations, for about the last three pressure points that we have run, our indications show that our oil in place calculations are, have been uniform for about the last three times which is some indication that our calculations are getting closer to what we think the actual performance of the reservoir will be.

I would like to point out a couple of things about the KGKO curve. In a reservoir of this type, which is a typical solution gas, this is the thing that needs to be changed in order to get more recovery from a reservoir of this type. The only way you can do this is to flatten the latter portion of the curve, which we have had in the dotted line. This only can be done by one or two methods, either by putting some artificial energy in the reservoir or closing in of high ratio wells.

We don't feel that either is practical in this field, so we have gone ahead and made our calculations based on what we think will happen if all the wells continue to flow on the same basis.

Q You say you don't think either one of these methods of controlling that curve are practical. For what reason?

A Well, one of the main reasons, if we were to inject water or fluid, this would mean draining of additional wells, which at this depth will be quite costly where we wouldn't be sure after we drilled the wells whether the injection would be successful. Shutting in of the high ratio wells would possibly mean that

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the field would have to be unitized. We have some reservations, in that the method to approach for unitization presents a problem because of the dry hole in between the Trigg well and the Continental well. Furthermore, to enhance the problem, we have both Federal and State royalty involved.

Q Actually, in what constitutes at best a three well reservoir, shutting in one well wouldn't make a tremendous difference, anyway, would it?

A Not in my opinion, it wouldn't help too much.

Q Refer to Exhibit 9; what does that reflect?

A Well, this is a curve of the cumulated oil production versus GOR and bottom hole pressures. The solid lines, of course, are actual performance; the dotted lines are our predictions, based on the KGKO curve and other material balance calculations that have been made.

I would like to point out one thing, in so far as the evidence that we have seen so far, this has probably been a textbook example of a solution gas drive. Cities Service has watched this reservoir, I think, pretty well ever since the inception of drilling the State "AX" No. 1. We have run 27 bottom hole pressures. We have run fluid analyses and we ran GOR's fairly regularly in the early life of the field in an attempt to try and establish where the ratio might increase and hope that there might be some evidence of when the saturation pressure would be reached.



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This curve indicates that an abandonment pressure of 100 pounds at the Cities Service State "AX" No. 1 is expected to recover 548,000 barrels. As I said previously, it has recovered about 383,000 to date.

Q Have you made a study of predicted performance under various gas-oil ratios?

A Yes, we have. I might add a little bit, going back, not going back to the previous curve but bringing you up to date. Our material balance calculations indicate that the Cities Service State "AX" No. 1 is draining from oil in place of 2.6 million barrels. We expect to recover 548,000 barrels or 21 percent of the oil in place, which is about in line with reservoirs of this type. Using this oil in place material balance calculation, and applying volumetric figures, this indicates that we're draining in excess of 800 acres with this one well.

Now, we did not run a complete field material balance because of lack of evidence. We do not have early GOR's from the other wells, nor do we have adequate pressures. In fact, I had available to me only four other pressures from wells in comparison to our 27, so this is the reason that we have confined our material balance calculations to the one well.

Q This exhibit that you referred to, that's Exhibit No. 10?

A No. 10 is the past performance record of the Cities Service State "AX" No. 1, and also in dotted line we have the



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performance prediction under a 2,000 to 1 limiting ratio, and also under a 6,000 to 1 limiting ratio. I'll say before we go any further in this that it's our opinion that recoveries under either of the ratios will not be altered, ultimately. In making these calculations, we have assumed that the recovery of oil and gas will be the same in both cases.

I believe that you will note that in this particular curve, that the well, or the economic limit of the well will be reached in 1974, as compared to 1980 in the case of 2,000 to 1, reducing the producing life of this field some six years, which will save us considerable amount of money in operating expenses.

Q There will be no loss of production as a result of the change?

A Not in our opinion, there will not be.

Q Have you made a comparison of the economics of this over the period?

A Yes, this is our last exhibit, which was an income --

Q Exhibit No. 11?

A Exhibit 11, which is an income comparison on a 2,000 GOR as opposed to 6,000 GOR limit. First column indicates we will reach the economic limit at 1980 under 2,000 to 1 as opposed to 1974 under 6,000 to 1. The oil production is the same in both cases, the gas production is the same in both cases. The investment of \$20,000 is for installation of artificial lift equipment,



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which would come in 1970 on a 2,000 limit, and at 1966 on a 6,000 limit.

The operating expense would be reduced by some \$11,000. I think the most important thing to indicate is that the present worth is approximately \$44,000 greater in the case of the 6,000 as opposed to the 2,000 GOR limit. This, in our opinion, is conservation of money.

Q Mr. Motter, the pool is presently on a 2,000 to 1 ratio, is it not?

A That's correct.

Q Is there any particular reason you have advocated the use of a 6,000 to 1 ratio?

A Yes, I have several reasons, as I stated earlier. It will improve the producing characteristics of the reservoir. This will possibly prevent gravity segregation and stop the solution gas from breaking out of the oil.

Number two, I don't believe the ultimate recoveries will be altered.

Number three, the producing life of the field will be reduced about six years, which will reduce the operating cost and increase the present worth of the Cities Service State "AX" by approximately \$44,000.

Q Would it have a similar effect, in your opinion, on other wells than the Cities Service wells?



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A I think all the wells in the reservoir will tend to produce until the abandonment pressure of approximately 100 pounds, if they produce nothing but gas. I think all the wells out there will probably be producing the same length of time. Any time that you can shorten the life of the field, anybody that works on present worth of money will see that this saves the money.

Q The question of whether they will produce oil or gas will be governed to a large extent by their structural position, in any event?

A That is correct.

Q Will the change in the GOR materially change that factor?

A You couldn't gain any structural position by changing GOR.

Q Could they gain any more oil or lose any more oil?

A I don't believe so.

Q Is the gas being marketed at the present time?

A Yes, it is. We have contacted the purchaser, and they are quite willing to take the gas. The extra gas will be produced, in the event that the Commission sees fit to award us a 6,000 to 1 limiting GOR.

Q Were Exhibits 1 through 11 prepared by you or under your supervision?

A Yes, they were.

MR. KELLAHIN: I will now offer in evidence Exhibits 1



through 11.

MR. UTZ: Without objection, Exhibits 1 through 11 will be entered into the record in this case.

(Whereupon, Applicant's Exhibits Nos. 1 through 11 received in evidence.)

MR. KELLAHIN: That's all the questions I have on direct examination.

MR. UTZ: Are there questions of the witness?

MR. LOSEE: A. J. Losee, appearing for Mr. John Trigg.

CROSS EXAMINATION

BY MR. LOSEE:

Q Mr. Motter, your Exhibit 10, which is the production history, only covers the Cities Service State "AX" No. 1 Well?

A That's correct.

Q Predicting performance at 2,000 to 1 and 6,000 to 1 limiting ratios?

A Yes.

Q It doesn't cover, or purport to, the effect of the ratios on the John Trigg well?

A No, sir, it does not.

Q I believe you stated on direct examination that in your opinion the 6,000 to 1 limiting ratio would not affect the ultimate recovery from the Cities Service well?

A That's correct.

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Q But isn't it true that that limiting ratio would effect a loss of production in the John Trigg well, higher structurally?

A When you speak of production, are you referring to oil and/or gas?

Q Oil, ultimate oil recovery.

A I don't think that there will be a loss of recovery. I believe that well will recover as much oil under 2,000 as it will the 6,000. I think there is a short period of time when the capacity, oil capacity of that well will probably not be able to produce what its allowable will be under 6,000. However, this will be a very short period of time, in my estimate.

We don't even feel that our well can produce that capacity but for perhaps a year, and this is shown by our Exhibit No. 10.

Q Do I understand you to say that it is your opinion that their well will not have the ability to produce capacity, even under this 6,000 to 1 limiting ratio?

A If my figures are right, the last C-116 filed on the well indicated it has a capacity of 40 barrels. I don't know if this is capacity or not, but I assume it is. That was filed April 22, 1964. Under my calculations, with a 19,200 GOR that was filed on that well, it would have a 56-barrel per day allowable at 6,000 to 1.

Q So that actually at this point it's not able to produce



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at capacity?

A I might also point out that the Continental well only tested for nine barrels a day, so it would be way below its allowable.

Q Mr. Motter, isn't it generally true that higher producing rates waste reservoir energy in a solution gas drive reservoir?

A No, I don't believe that's true.

Q Well, is it generally true that higher producing rates conserve reservoir energy in a gas solution drive reservoir?

A We think in this particular case there's a possibility we can conserve some energy by sweeping the oil ahead of the gas that will be produced at higher producing rates, which will in effect conserve some energy.

Q My question was, was it generally true, not referring to this specific reservoir.

A I think that producing rates on any solution gas drive - I should say producing rates which are presently being set by proration agencies are not in excess to the effect that they would hinder the recovery of the reservoir. What I'm saying here is that the allowable for this reservoir presently would be 177 barrels of oil, and I don't believe or I can't see that the Commission would set any oil allowables far above this to where any harmful effects would come to the reservoir.

Q Let me back up, Mr. Motter. I may not have made the



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first question clear. Not referring to this reservoir, but to gas, solution gas drive reservoirs, isn't it generally true that higher producing rates waste reservoir energy?

A Not in my opinion.

Q Well, then, you would actually say then that it was generally true that these higher producing rates would conserve reservoir energy in a gas solution drive reservoir?

A No, sir, I believe I stated previously that it's our opinion that any producing rate -- now I should again clarify this, which we feel would be granted by any regulatory body, more specifically, the New Mexico Commission, could be produced in this reservoir without altering the energy of the reservoir.

Q Mr. Motter, I'm not referring to this reservoir. I'm referring to all reservoirs.

A Any reservoir, then.

Q Would you then actually recommend to the Commission that they eliminate their standard 2,000 to 1 GOR?

A No, I think each field has to stand on its own.

Q Don't you think the reason that they have a 2,000 to 1 limiting GOR is because of the fact that higher producing rates waste reservoir energy in a reservoir of this type?

A We have seen a lot of Pennsylvanian reservoirs in New Mexico that have higher ratios. We have seen some that are 2,000. I think the performance of the reservoir itself has more or less



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dictated what ratio penalty should and has been in effect in that field.

Q How long did you test your well in this field?

A Oh, it's been flowing since 1956.

Q How long did you test it since its production has declined because of the limiting GOR?

A Well, the first GOR penalty, our first effect of GOR penalty was in 1962.

Q I believe you mentioned that you tested it on May the 6th and May the 7th?

A That's correct.

Q On May 6th, producing it at 117 barrels per day, the GOR was 6218; and producing at 149 barrels per day the following day, the GOR dropped to 5500?

A That's correct.

Q Have there been any other days in which you conducted similar tests with similar results on this well?

A We tested once in March, earlier, 124 oil at a 3200 to 1 ratio. I might go back again, I don't remember which exhibit it is but Cities Service "AX" No. 1 production,--

MR. KELLAHIN: Exhibit 4.

A -- the ratio GOR on it, and show what has happened at the lower producing rates. We think that the gas is escaping ahead of the oil or breaking out of solution, since the permeability of



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gas to oil is much greater, why, it comes through the formation easier and these lower producing rates, our sales ratio shows that they normally go up when penalty is imposed on the well.

Q Is this two-day test in May the only time that by producing the well at higher rates, you've had your GOR go down?

A That's correct. We only have run this two days at one time, is the only test we have run.

Q Isn't it true that that condition is probably only a temporary condition in your well?

A Well, I don't think so, nor do our reservoir people believe this is true. If we would have tested this well longer, we would probably have had to get special permission from the Commission. I think just this two-day test here is about allowable for close to five days and we couldn't test it too long at this period.

Q Then I understand it's your testimony that this is probably not a temporary condition in your well. Would you admit that there is a possibility that this is only a temporary condition and that after you had produced your well for a period of time, the GOR would go back up?

A Well, I don't think anybody in this room knows how this reservoir is going to perform tomorrow. I will say that this is a possibility, but we feel that the ratios will go down temporarily.

Now, I think our previous curves here, No. 9 indicates



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that we believe that on out here a little while later, we are going to experience ratios up as high as 14,000 to 1. So I would almost have to be lying to myself here if I decided that the ratios wouldn't go up with continued production of the well.

Q Well, at the expiration of the temporary condition, that is, the reduced GOR, at the expiration of that time would you admit that reservoir energy would then commence being wasted?

A I don't believe --

MR. KELLAHIN: If the Examiner please, I ask that counsel clarify the question to state what he means by "temporary condition," whether he's talking about one day or one year, or as shown by the exhibit, a long period of time, as being temporary.

MR. UTZ: Would you do that, Mr. Losee?

MR. LOSEE: Well, I was referring to the witness' answer to the last question, in that he said he would have to admit there was a possibility that this was a temporary condition and that sooner or later the GOR would start back up.

Q (By Mr. Losee) At that point, my question is, would you then not commence to waste your reservoir energy?

A I don't believe that I said this was temporary. If I did, I didn't mean to infer that. What I said was that we have shown by Exhibit No. 9 that we expect the ratio, GOR ratio to go up with future production of oil. I don't believe that this reduction in GOR will probably occur for a period of time, but we will



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see it go up as oil is produced. There's no way of getting around this in a solution gas oil reservoir of this type.

Q When it does go up, though, would you not be wasting the energy in the reservoir?

A Not in my opinion, no, not at the capacities of oil which we can expect to produce out of these wells.

MR. LOSEE: That's all the questions.

REDIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Motter, in connection with this increased GOR, actually the GOR as shown by your Exhibit No. 9 is going to increase regardless of the rate of production or the limiting ratio, is that not true?

A Yes, that's true.

Q Isn't that a characteristic of a solution drive reservoir?

A That would be true.

Q Then there could be no waste of reservoir energy contemplated under the production proposals that you have made here?

A No, and I would like to point out in talking about reservoir energy, if you come back to a per barrel basis, now I am comparing our well with Trigg's well, mainly because we know that they are both in the same reservoir, pressures have been fairly identical -- I only have one pressure that they have run but it was real close to ours; and on a per barrel basis they are voiding four times the



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reservoir on a per barrel basis, as far as energy is concerned.

Q And the utilization of the reservoir energy per barrel of oil is measured by reservoir voidage, is it not?

A Yes. Is it the --

Q Which causes a further increase in the GOR, does it not, as the reservoir voidage increases, why, your GOR increases?

A That is correct. I'm sorry.

MR. KELLAHIN: That's all.

MR. UTZ: Any other questions?

MR. DURRETT: I have one.

RECROSS EXAMINATION

BY MR. DURRETT:

Q I believe you stated that the amount of acreage that you thought this well was draining, your "AX" No. 1, what was that?

A It's in excess of 800 acres.

Q What is the spacing in this pool?

A Forty acres.

Q If you increase the gas-oil ratio, you will produce more gas, isn't that correct, and more oil?

A And more oil, yes.

Q And more gas, too?

A Well, it will be -- the ratio will probably gradually go up as we have predicted here.

Q Then you would drain even a bigger area, would you not?



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A Not necessarily. Right now I think we've talked about oil in place of 2.6 million barrels, and we have recovered about 15 percent of the oil in place. We expect to go to 20.7. I don't think the drainage radius will increase, it will just be the mere fact that we will get the oil out, the oil in place.

Q You don't think your area will increase?

A No, sir.

Q You are speaking of the ultimate area--

A Right.

Q -- that would ultimately be drained?

A The material balance indicates that we are draining off 2.6 million stock tank barrels and this is what we have to stay with. The last three pressure points we have run on material balance, we have come up with this same figure each time. We think that this is a pretty good verification that this is drainage, as far as barrels are concerned.

Q Then would it be fair to say that although you don't feel that you have drained a larger ultimate area with the increased GOR, that you would drain an area sooner?

A Oh, yes, we'll drain it six years sooner, is the way I feel.

Q How many other operators are there in this pool?

A Currently there are only two, Trigg and Continental. Continental's well, by the way, has, the last C-116 was filed on



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test April 7th, 1964, was nine barrels of oil with a GOR of 8766. However, I would like to point out that their producing ratio is in the neighborhood of 23,000 to 1; first two months of 1964.

Q Was the Trigg well and the Continental well, are these wells draining comparable areas with your well?

A I believe I said earlier I haven't made those calculations due to limited information on those wells. We don't know what the GOR's were earlier. We don't know what the bottom hole pressures were. We do have real good information on our well.

Q So you couldn't really state that one way or another?

A No. I would think that the Continental well is not draining a very large area. I think the producing history is better. I think it's only made some 27,000 barrels.

MR. DURRETT: Thank you.

BY MR. PORTER:

Q Mr. Motter, on your exhibit showing the income comparison, I believe you indicated that ultimately the same amount of oil and the same amount of gas would be recovered under the two limitations?

A That's correct.

Q Then the only thing that you have to gain would be the shortening of the production life of the well; in other words, you will get as much oil but you'd get it sooner?

A Right. Of course, we would cut the operating costs considerably.



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Q That would be your advantage. You think this same thing would apply to all the other wells in the pool?

A I'll say this, that on a -- considering the present worth of the income from a pool, any time you can reduce the life by six years, you'll gain about fifteen percent on your money.

Q Do you think that the other wells in the pool would recover the same amount of oil and gas, regardless of the limit here?

A As the Cities Service well?

Q Yes.

A No, sir, I don't think they will.

Q I don't mean will they recover as much oil as the Cities Service. Does the same thing apply to those wells as applies to you? Will they recover as much with 6,000 as they will with a 2,000 to 1?

A I think that the Continental well will, and in fact, I think I said earlier -- this was brought out by Mr. Losee -- I don't know whether Trigg has the capacity to produce 56 barrels, but, however, that would be his allowable under 6,000 to 1 ratio. However, I feel that the decline of these wells, that he'll be able to produce just about as much. I can't put my finger on it, but it would be a very small amount.

Q In other words, you think that the performance of the other wells in the pool pretty near approximates this one?



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A Right. That's the only factor that is different, is the fact that his capacity is right at, as filed on the C-116, 40 barrels. He could suffer a 16-barrel a day loss for a very short period.

MR. PORTER: That's all I have.

BY MR. UTZ:

Q Did you indicate, Mr. Motter, that the producing ratios were higher than 2,000 to 1 at the present time?

A Yes, they are, in all cases.

Q What is the producing ratio of your well?

A Well, we just got through filing a C-116 at the ratio of 5,550. I have the other two here, if you would like them. The latest GOR tests, Continental well has an 8766 GOR and Trigg has 19,200.

MR. PORTER: Those are actually test ratios?

A Those are test ratios. Now the producing curves indicate actual sales ratios. They are all selling to Phillips Vacuum Plant.

Q Your last month's production that you have available, what is the producing ratio of your well?

A Of our well?

Q Yes.

A The last ratio was 8350 for the month of March.

Q So actually, with the 2,000 to 1 ratio, you are actually



producing at the ratio of 8350?

A Right.

Q So if you went to 6,000 to 1, what do you think the producing ratio would be?

A I don't think it would be higher than what it is right now.

Q You think it would be about the same?

A Eventually it's going to go up, as we have shown on Exhibit No. 10, but the capacity, oil capacity of the well will go down and penalty will probably not affect it any.

Q Have you taken solution ratios as test samples, bottom hole samples of solution ratios, as shown on one of your exhibits back here, Exhibit 7? Are those calculated or by test?

A They are by tests. I have the actually completed report. Basically, this is all that's essential, what most people use.

Q Those solution ratios are all below a thousand?

A Yes, they are. This I might add, too, our thinking -- the people in our home office came up with this, that we are experiencing a lot of gas break-out of solution, giving a two-stage flow, adding to the problem.

Q It's your opinion that producing faster will eliminate some of the breaking out of the gas out of solution?

A Right.

Q Is it your opinion that there is any gascap in this area

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at all?

A Yes, I think there might be. It would be kind of hard to pinpoint any actual gas-oil contact.. The Continental well being high and having ratios up in the neighborhood of 23,000, this could be very close to a gascap. Of course, it doesn't take very much relief in reservoirs of this type to put you in a gascap. It's really hard to pin down.

Q Do you have any figures available to show what the producing ratio is of the Continental well?

A In February it was 23,000 to 1.

Q So as I interpret your testimony, then, an increase in ratio to 6,000 would not increase your producing ratio, but would increase the volume of the oil production?

A Increase the volume of oil production. I'll have to again clarify this producing ratio. It has to go up eventually.

Q Yes.

A This benefit we think we might get would be for a period of time, but any solution gas is going to go up. I think our curve will show that we will expect ratios of 17,000 to 1 before we start back down. This is in Exhibit 10. These are our expected ratios. When we get out here to approximately 460,000 barrels, we'll be experiencing ratios in the neighborhood of 13,400.

MR. UTZ: Any other questions of the witness?



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MR. PORTER: Just one more question.

BY MR. PORTER:

Q What was the date of your last test, gas-oil ratio test that you said was about 5500?

A May 7th.

MR. PORTER: Thank you.

MR. UTZ: Any other questions? The witness may be excused.

(Witness excused.)

MR. UTZ: Any statements in this case?

MR. LOSEE: I have a witness, Mr. Examiner.

(Witness sworn.)

(Whereupon, Trigg's Exhibit No. 1 marked for identification.)

JACK R. MCGRAW

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. LOSEE:

Q Will you state your name, residence, and occupation?

A Jack McGraw, I work for Mr. John Trigg at Maljamar, New Mexico. I am presently employed as a reservoir engineer.

Q How long have you worked for Mr. Trigg?

A Approximately four years.

Q Have you previously testified before the Commission?



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A Yes, sir, I have.

MR. LOSEE: Are his qualifications acceptable?

MR. UTZ: Yes, sir, they are.

Q (By Mr. Losee) Would you please refer to what has been marked Exhibit 1, and explain the data that is shown on this performance graph?

A This is a graph of the past performance of the two wells mentioned in Mr. Motter's testimony, the only difference being -- I have plotted them on the same ratio and on the same chart that he used, only he used separate sheets of paper.

Q Did you omit the Continental well?

A Yes, I did, since it represented only approximately three percent of the reservoir, I didn't bother to show it.

Q What does this graph show with respect to well performance up to date?

A Well, it shows that we, of course, were all capable of producing the top allowable through 1960 and to May of 1961, at which time the Trigg well became penalized for gas-oil ratio reasons; and for the past two years it also shows that at a 2,000 to 1 limiting gas-oil ratio, we have been able to produce on the average of some 37.63% of the total oil coming from the field from these two wells.

Q Is that past performance, that percentage figure, or is that partially projected?



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A That is the past performance. Then I also show it projected, if it continued on a constant percentage decline, which, of course, would show considerably shorter amount of life and considerably less oil to be recovered than Mr. Motter showed. However, I did not intend this to represent the total amount of recovery in any way, just our percent of that total, whatever it happened to be.

Q Mr. McGraw, I believe Mr. Motter gave the production history of each of these two wells up to January 1, 1964, at 281,000 for the Trigg well and 383,000 for the Cities Service well. As between those two wells, what has been the percentage of recovery?

A That's some 41.5 percent to the Trigg well, and, of course, the remaining to the Cities Service well.

Q That would be 58.5 percent to the Cities Service?

A Yes.

Q Then your 37.63 percent figure is not entirely past performance; it's past performance from what period?

A From the period of time that we stopped producing top allowable.

Q The ratio was shown at 37.73 from that point on?

A That's right. Since our ratio has, gas-oil ratio has increased at a more rapid rate than theirs, we actually have declined somewhat in our percent of the total fluids that we're



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able to produce.

Q But that percentage decline, since both wells have quit making top allowable, the line is substantially parallel one to the other?

A Yes, they have been for the past two years.

Q Have you continued the projection of the performance on these two wells at a 2,000 to 1 and 6,000 to 1 limiting ratio?

A Yes, the dotted lines on the graph show the rate at which the wells would produce if the 6,000 to 1 GOR was granted, the Cities Service well being able to go to approximately 150 barrels per day; the Trigg well going to slightly less than 40 barrels per day, which would give them 80 percent of the total oil recovered from the reservoir and the Trigg well, of course, 20 percent of that total, which is a decrease of some 17 percent of what we have been getting for the past two years at a 2,000 to 1 GOR.

Q Have you calculated at what limiting ratio your well would be able to produce practically the same number of barrels?

A Yes, sir, at approximately 3500 to 1 limiting gas-oil ratio, we would be able to continue to produce at our approximate present rate of 35 to 40 barrels per day; I believe our allowable would be 34 at that rate.

Q Does this graph also show the past performance of the GOR's, based on sales?

A Yes, it does. The heavy line representing approximately



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both wells' gas-oil ratio, and when they separate, then the lighter line is the Trigg well gas-oil ratio. Now I've drawn a smooth curve through, of course, the points are much as Mr. Motter showed. This is merely a smooth line drawn through those points. It shows that at our present producing capacity which we have our well producing on a 22/64 choke with approximately 300 pounds of flowing tubing pressure, gas-oil ratio is 19,200 to 1. We tested this well after this gas-oil ratio went in on the C-116 report, we tested our well wide open to see if it was capable of making more oil, and it was not. As we show in this dotted curve down here, the oil production stayed the same or actually dropped to 38.8 barrels per day, the gas oil ratio went to 25,000 to 1.

That was with no back pressure through a wide open choke. We pinched the well back in to something like 32 to 34 barrels per day, and the GOR comes back down to 19,200.

MR. PORTER: At this point, let me ask you if that 19,200 to 1 is a test ratio?

A Yes, sir. It's also an average of our sales. In other words, our sales for the past month was somewhat less than that, but not very much, the test being a little higher than the sales ratio.

Q (By Mr. Losee) In your opinion, would the correlative rights of the interest owners in this pool be protected at a limiting 6,000 to 1 ratio?



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A I don't believe they would be, because, as shown on this graph, because of our limited ability to produce oil. We can produce gas but we're certainly wasting reservoir energy when we do.

Q What effect would you think this 6,000 to 1 limiting GOR would have on the reservoir?

A I would say that it would cause a reduced amount of ultimate oil recovery due to this wasting that we know will take place in our well because the ratio goes from 19,000 to 25,000, simply by opening the choke, and with only a very small increase in oil.

Q Is this what you can normally expect in a solution gas drive reservoir?

A I think it is.

Q Mr. Motter testified that in their two-day test they conducted back in May, they had an apparent drop in GOR at higher producing rates. Can you explain in your opinion what may have caused that?

A Well, I feel personally that it is simply due to a flushing action right around the well, and this faster rate will move more of the total fluids into their well bore; but as soon as that is cleaned up, so to speak, or flushed out, which probably would be a very short period of time, their gas-oil ratio will go back to the 8,000 or 8500 to 1 that they have been producing at at



the slower rate.

Q In your opinion would what be the most efficient way to recover the oil in this reservoir?

A Well, the most efficient way, of course, would be to unitize the two tracts and close in our well, which is some 37 feet higher structurally than theirs, and produce the oil out of their well since they have shown they can effectively drain 800 acres and our 40 certainly lies within that 800.

Q Would Mr. Trigg be willing to unitize his tract?

A Yes, we would.

Q Did you prepare Exhibit 1, Mr. McGraw?

A Yes, I did.

MR. LOSEE: We offer the exhibit into the record.

MR. UTZ: Without objection, Exhibit 1 will be entered into the record in this case.

(Whereupon, Trigg's Exhibit No. 1 received in evidence.)

MR. LOSEE: I have no further questions at this time.

MR. UTZ: Are there questions of the witness?

MR. PORTER: Yes.

CROSS EXAMINATION

BY MR. PORTER:

Q What is the present producing rate of your well as far as oil is concerned?

A Well, on our GOR test for April, it produced 40 barrels

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of oil at a 19,200 to 1 GOR. Some week or two later we tested it wide open and the well would only make 38.8 barrels per day; this is on an average of an eight-day test at a 25,000 to 1 GOR, that's average, also.

Q What allowable do you have at the present time?

A Our present allowable is 45. Of course, when this GOR goes in this time, it will be cut to 19.

Q In other words, you are presently producing under some previous test?

A That's right, last year's test.

Q This 19,200 has not gone into effect?

A That's right. It will go into effect, though, in the very near future. At that time we will be cut to 19 barrels per day on our well. That is the reason we mentioned the 3500 to 1 GOR; if it were reduced to that, then we would, of course, be able to remain, our allowables would be 34 barrels per day. We could produce that. That's approximately the same GOR.

Q In other words, if a 3500 to 1 limitation were established, you could produce as much oil as you are now producing?

A Yes, sir, approximately.

Q Do you think the ultimate recovery of oil from your well would be as much at 3500 as it would at 2,000?

A Well, I don't exactly know what our GOR would be if we are required to pinch it back to 19 barrels per day. We have not



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tested it. Possibly it would reduce the GOR a little bit. If it did, well, of course, that much energy would be conserved.

Q But you are of the opinion that if it's produced, if this limiting ratio is raised to 6,000, that there would be some waste of reservoir energy?

A Certainly will in our well.

Q That's what I was asking about, your particular well.

A Yes.

MR. PORTER: That's all I have.

MR. UTZ: Any other questions?

MR. DURRETT: I have a question.

BY MR. DURRETT:

Q Mr. McGraw, how many acres do you think that your well is draining?

A We feel we are draining more than 40, of course. We've made -- if we haven't, we have made 2800 barrels an acre, which isn't too likely.

MR. PORTER: There's no acres left for your well to drain.

A We are in there helping him get his.

Q (By Mr. Durrett) You think you might be in on that 800?

A Yes.

MR. DURRETT: Thank you.

A The thing is, we want to stay in.

MR. UTZ: Any other questions?



BY MR. KELLAHIN:

Q Mr. McGraw, in preparing your Exhibit No. 1, as I understand, the curve here at the beginning is actual production, is it not?

A Yes, sir.

Q That is your penalized production under the GOR?

A Yes, sir.

Q It doesn't reflect the capacity of the wells to produce in any sense of the word?

A No.

Q Then what you have done is merely project the actual penalized production as being the ultimate performance of the well?

A I have shown the actual penalized production because that is the performance of the well.

Q Isn't it a fact that your well has shown an increase in the GOR?

A Yes, sir.

Q That would call for further penalized production, would it not?

A Yes, sir.

Q That would reduce your projected production, would it not?

A Yes, sir.

Q Have you made a material balance curve on your well?

A No, sir, we haven't.

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Q You don't know then what the production performance of that well is in regard to its reserves, do you?

A No, sir, we don't.

Q Your well, as I understand it, has a capacity of approximately 40 barrels production at the present time?

A Yes, sir.

Q And Cities Service by its test shows a production capacity of 147 barrels?

A Yes, sir.

Q That's approximately. You show approximately, then, 25 percent capacity as against the Cities Service well?

A Yes, sir, that's right.

Q Yet you feel that you are entitled to produce 37 percent of the production?

A Yes, I do, because they are 37 feet lower than we are. They can actually produce all our oil if we would shut our well in.

Q Do you think that an operator should be penalized because of his structural position?

A Well, as the Oil Conservation Commission rules stand, I think they should have to abide by those rules.

Q I assume you are referring to the GOR rules at the present time in this pool?

A Yes, that's right. Their ability to produce should be limited as the Commission has set forth.



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Q Without regard to the effect that that type of production might have on the economics of the reservoir?

A Well, this, of course, brings in a lot of things, and one being that since we are higher structurally, they can actually pull the oil out from under our well. When we get our well, our well being closer to the gascap that has been created since, we passed the bubble point pressure, of course, well, actually our ability to produce has not declined; it's simply our ability to produce oil, and that we feel that we have a right to what was under our lease, the same as what is under it now.

Q You are marketing the gas production, are you not?

A Yes, we are.

Q Have you calculated the amount of reservoir space you are voiding as against the reservoir space voided by Cities Service?

A Yes, sir, it's atrocious.

Q It's considerably more, is it not?

A Yes, sir.

Q The curve you have prepared is the type of curve that is normally used in a water drive reservoir, isn't it?

A No, sir, I don't believe so. I believe constant percentage decline is oftentimes applied to solution gas reservoirs. I would like to restate that I do not anticipate that the production will follow these lines. I think there will be some flatten-



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ing as his curve shows, but I believe that we would be able to stay in that same ratio as I show here, and I simply extended it as a straight line just to show the ratio, in other words.

Q In the performance of a reservoir of this type, why, your gas-oil ratios will reach a peak and then decline toward the end of the productive life of the pool?

A Yes.

Q You don't show this on your exhibit?

A No, I don't project the gas-oil ratio at all. However, I do disagree with Mr. Motter's theory that it will only go to 13,000 to 1, since we are already at 19 and the Continental well has gone to 24. We know ours will go to 24. I think his would probably go higher, also, and more rapidly than he shows.

Q Referring to the KGKO exhibit, it's Exhibit No. 8; do you disagree with the conclusions shown on that exhibit?

A No, sir, I don't. I believe that in order to flatten that, we probably should do what Mr. Motter said, close in the high gas-oil ratio well.

Q That is, shut-in in your well?

A Yes, provided, of course, we can unitize before.

Q Exhibit No. 10 was calculated from that exhibit, and yet you say the ratio will go higher. You disagree with this exhibit now?

A Well, not being completely familiar with it, if that is



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where the calculations were drawn from, yes, I would think that it must be in error to some extent because of the performance of the reservoir.

Q Actually, on your basis, in your exhibit you projected or penalized allowables for Cities Service and for John Trigg. The end result is, regardless of the GOR, you are going to get about the same amount of oil in both instances, are you not?

A Yes, sir. That's, I believe, true; and my chart shows that the only thing that changes is which well this oil comes out of.

Q Do you mean that you can make allowable predictions on reservoir performance without a material balance curve?

A I believe that the performance history, with this much past performance you can make some reasonable calculations, yes.

Q Just assuming for a moment then that your curve ended at the end of 1961 and you were going to project that, what kind of a curve would you make then?

A Well, I would prefer not to go into the reservoir calculations at this point; since Mr. Trigg does not spend the money to obtain the information to make these calculations, I'd just rather not discuss it.

MR. KELLAHIN: That's all. Thank you. I have no further questions of the witness.

BY MR. UTZ:



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Q Your position, as well as the producing ability of your well, actually is what is affecting your anticipated recovery, is it not?

A I am sorry, I didn't understand the question.

Q I say your structural position in the pool as well as the ability of your well to produce are the main things that are affecting your anticipated recovery of your well?

A Yes, sir.

Q The GOR going up will also affect that, will it not?

A Well, the GOR goes up because of it, because of our structural position.

Q Which would also lower your recovery due to the penalty?

A Yes, sir, and I show that to a certain extent.

MR. UTZ: Any other questions of the witness? The witness may be excused.

(Witness excused.)

MR. UTZ: Any statements in this case?

MR. MORRIS: Mr. Examiner, Shell Oil Company wishes to support the application of Cities Service Oil Company in this case.

MR. DURRETT: If the Examiner please, I would like to state for the record that we have received two telegrams, one from Gulf and one from Superior Oil Company, stating that they support Cities Service in this application.

MR. UTZ: Mr. Morris, does Shell Oil Company have an



interest in this pool?

MR. MORRIS: Yes, sir, Shell has some undivided interests in this pool. The extent of their interest I am not aware of, but they are a working interest owner in the pool.

MR. UTZ: I would assume that also Gulf and Superior must have some, since they sent in telegrams.

MR. KELLAHIN: If the Examiner please, I think that's reflected on Exhibit No. 1.

MR. UTZ: Any other statements?

MR. KELLAHIN: I would like to make a brief statement in behalf of the Applicant. I think the case is relatively simple in that our witness has testified that, due to the proposed increase in GOR, if granted, the productive life of this pool will be reduced but the ultimate recovery will not be affected.

The resultant savings will amount to considerable amount of money over the life of the pool, and there will be no loss in recoveries.

The witness has made a thorough study, as shown by some 27 bottom hole pressure tests, I believe is the figure given, a complete analysis of the productive history of the well operated by Cities Service, and no analysis was made of the other wells, simply because the information was not available.

A material balance curve has been constructed, showing the predicted performance of the well on a reliable basis, against

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which you can determine the effect of the application of 6,000 to 1 ratio. In opposition to this, now, we have been offered a projected curve based on the penalized allowable assigned to the well. That is a meaningless thing in a solution gas drive reservoir simply because it has no bearing on the productive capacity of the well, it has no bearing on the reserves underlying the well, and it has no bearing on the past history, basically. It reflects in this instance, we feel, maybe the structural position of the well and that's about the size of it.

On the basis of that, why, John Trigg Company would attempt to show that they would be damaged by the application of 6,000 to 1 ratio. Actually, what we are talking about here is-- and I think our testimony clearly shows that they will not be damaged, but what we're really talking about here is the right to use the reservoir energy to recover the just and equitable share of the oil.

They are talking about the right to recover some 37 percent of the allowable on the basis of the history of the well since approximately 1962. They say they are entitled to recover 37 percent of the oil based on past production. Actually, their only witness admits that they were utilizing an atrocious amount of the reservoir energy. The productive capacity of their well is some 25 percent of that of Cities Service well. All these factors I think should be considered by the Examiner in reaching a



conclusion, and we submit that 6,000 to 1 ratio is a reasonable basis on which this pool should be produced.

MR. LOSEE: Mr. Examiner, on behalf of Mr. Trigg I would like to point out that the production history upon which these conclusions were made at 37.63 percent with the limiting ratios in effect, and the ability of the well, actually correspond to the 14.58 percent cumulative production of both of these Cities Service and Trigg wells. Mr. Trigg believes that increasing limiting GOR will, as to his well, cause waste of reservoir energy and that his correlative rights and those of the interest owners will not be protected, in that he would be prevented from recovering his fair share of the oil that is in place; and for these reasons, we request that the Commission deny the Cities Service application.

MR. UTZ: Any other statements? The case will be taken under advisement.

We will take a ten-minute recess.

(Whereupon, a short recess was taken.)

* * *

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STATE OF NEW MEXICO)
) SS
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me, and that the same is a true and correct record of the said proceedings to the best of my knowledge, skill, and ability.

WITNESS my Hand and Seal this 27 day of June, 1964.

Ada Dearnley
NOTARY PUBLIC

My Commission Expires:

June 19, 1967.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3058 heard by me on May 27, 1964.

Shirley W. [Signature], Examiner
New Mexico Oil Conservation Commission



BEFORE EXAMINER UTZ

OIL CONSERVATION COMMISSION

EXHIBIT NO.

CASE NO.

20387

Table No. 3

Cities Service Petroleum Company
State AX No. 1, Reeves Penn Pool
Lea County, New Mexico

Differential Vaporization Data at 168 °F.

Pressure psig	Relative Volume of Oil Referred to Re- sidual Oil at 168°F.	Relative Volume of Oil Referred to Re- sidual Oil at 60°F.	Solution GOR, SCF per Barrel of Re- sidual Oil at 168°F.	Solution GOR, SCF per Barrel of Re- sidual Oil at 60°F.	Oil Viscosity cp.	Oil Density gm/cc
4561 4555	1.4152	1.4906			0.49	0.6854
4253 4270	1.4196	1.4953			0.47	0.6832
3873 3865	1.4264	1.5024			0.45	0.6800
3513 3500	1.4332	1.5096			0.45	0.6767
3123 3115	1.4410	1.5177			0.44	0.6731
2773 2780	1.4478	1.5250			0.43	0.6699
2458 2445	1.4551	1.5329			0.42	0.6664
2203 2290 (BPP)	1.4592	1.5370	840 -	887	0.42	0.6647
1893 1880	1.3962	1.4705	700	739	0.46	0.6751
1563 1545	1.3642	1.4369	620	654	0.48	0.6809
1043 1060	1.2911	1.3600	474	500	0.55	0.7003
553 540	1.2156	1.2804	318	336	0.67	0.7189
295 285	1.1737	1.2363	233	246	0.75	0.7287
153 145	1.1407	1.2015	178	188	0.82	0.7371
100 87	1.1109	1.1701	138	146	0.87	0.7458
.0	1.0000	1.0533	0.0	0.0	1.19	0.7696

CITIES SERVICE OIL COMPANY
STATE "AX" #1
REEVES PENN POOL-LEA CO., N.M.
INCOME COMPARISON - 2000 VS 6000 GOR LIMIT

2000 GOR LIMIT						
Year	Oil Production Bbls	Gas Production MCF	Investment	Operating Expense	Net Cash Production	P.W. Net Cash Production
1964	12,876	121,094		\$ 1,250	\$ 20,696	\$ 20,086
1965	12,479	137,428		1,500	20,499	18,737
1966	11,745	139,074		1,500	19,532	16,812
1967	10,277	127,701		1,500	17,171	13,920
1968	10,277	131,457		1,500	17,290	13,193
1969	10,277	133,309		1,500	17,334	12,462
1970	10,277	133,309		1,500	17,334	11,737
1971	10,277	130,956	\$20,000	1,500	17,334	-1,432
1972	10,888	134,231		3,600	-2,249	10,505
1973	11,316	129,582		3,600	17,491	10,151
1974	12,820	128,689		3,600	17,948	10,652
1975	11,011	94,970		3,600	19,997	8,281
1976	8,319	62,023		3,600	16,507	5,583
1977	6,362	41,854		3,600	11,822	3,791
1978	4,894	29,094		3,600	8,524	2,563
1979	3,756	20,316		3,600	6,121	1,627
1980	2,659	13,174		3,600	4,126	4,878
TOTALS	160,510	1,708,261	\$20,000	\$44,450	\$243,261	\$163,546

6000 GOR LIMIT						
Year	Oil Production Bbls	Gas Production MCF	Investment	Operating Expense	Net Cash Production	P.W. Net Cash Production
1964	36,966	384,011		1,250	61,702	59,888
1965	31,172	398,727		1,500	54,005	49,365
1966	23,988	309,202	20,000	3,600	21,973	18,914
1967	18,265	215,873		3,600	30,124	24,429
1968	14,003	143,042		3,600	22,095	16,869
1969	10,715	93,327		3,600	16,090	11,568
1970	8,219	61,853		3,600	11,721	7,936
1971	6,271	41,313		3,600	8,425	5,371
1972	4,810	28,602		3,600	6,032	3,622
1973	3,714	20,344		3,600	4,081	2,307
1974	2,387	11,967		1,800	12,674	6,752
TOTALS	160,510	1,708,261	\$20,000	\$33,350	\$248,922	\$207,021

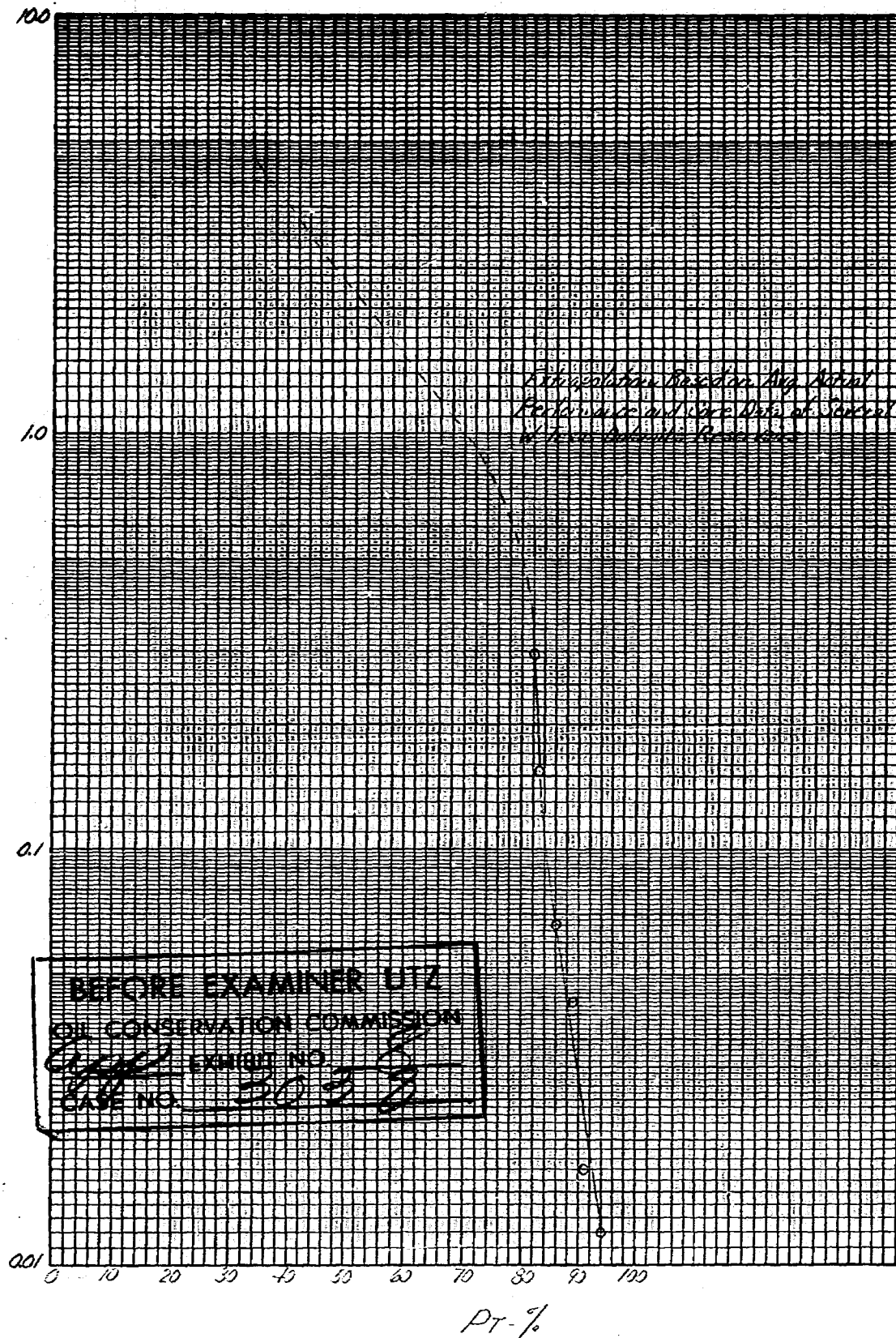
BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 11
CASE NO. 3058

STATE AX #1

CODER BOOK COMPANY, INC. NORWOOD, MASSACHUSETTS

NO. 3212. POLYPURPOSE. 72 DIVISIONS BY 3.3-INCH CYCLES RATIO RULING.

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