CASE 3470: Application of GULF for a special gas-oil ratio limitation, Lea County, New Mexico.

CASE NO. 3470

Application,
Transcripts,
Small Exhibits
ETC.

GOVERNOR
JACK M. CAMPBELL
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
GUYTON B. HAYS
MEMBER

P. O. BOX 2088
SANTA FE

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

October 4, 1966

Mr. Bill Kastler
Gulf Oil Corporation
Post Office Box 1938
Roswell, New Mexico

Re: Case No. 3470
Order No. R-3133
Applicant:

GULF OIL CORPORATION

Dear Sir:

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

Very truly yours,

A. L. Porter, Jr.
A. L. PORTER, Jr.
Secretary-Director

ir/

Carbon copy of order also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC
OTHER Mr. Ronald Jacobs

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. 3470
Order No. R-3133

APPLICATION OF GULF OIL CORPORATION
FOR A SPECIAL GAS-OIL RATIO LIMITATION,
LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on September 28, 1966, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 4th day of October, 1966, 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, Gulf Oil Corporation, seeks the establishment of a special gas-oil ratio limitation of 6,000 cubic feet of gas for each barrel of oil produced in the Justis-Blinebry Pool, Lea County, New Mexico.

(3) That approval of the subject application will afford to the owner of each property in the pool the opportunity to produce his just and equitable share of the oil and gas and for this purpose to use his just and equitable share of the reservoir energy.

(4) That approval of the subject application will prevent waste and protect correlative rights provided the flaring or venting of gas in the Justis-Blinebry Pool is prohibited.

(5) That in order to assure the protection of correlative rights, the operator of each well in the Justis-Blinebry Pool should file a new gas-oil ratio test with the Commission's Hobbs District Office on or before December 1, 1966.

IT IS THEREFORE ORDERED:

(1) That, effective November 1, 1966, the limiting gas-oil ratio in the Justis-Blinebry Pool, Lea County, New Mexico, shall be 6,000 cubic feet of gas for each barrel of oil produced; that, effective November 1, 1966, each proration unit in the Justis-Blinebry Pool shall produce only that volume of gas equivalent to 6,000 multiplied by top unit oil allowable for the pool.

(2) That the operator of each well in the Justis-Blinebry Pool shall file a new gas-oil ratio test with the Commission's Hobbs District Office on or before December 1, 1966, and shall furnish a schedule of test dates to the Commission's Hobbs District Office in order that the tests may be witnessed.

(3) That no gas shall be flared or vented in the Justis-Blinebry Pool more than 60 days after a well begins to produce or 60 days after the effective date of this order, whichever is later. Any operator desiring to obtain an exception to this provision shall submit to the Secretary-Director of the Commission an application for such exception with a statement setting forth the facts and circumstances justifying it. The Secretary-Director is hereby authorized to approve such an application if he determines that the exception is necessary to prevent waste. If the Secretary-Director declines to grant administrative approval of the requested exception, the matter shall be set for hearing if the operator so requests.

(4) 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, Chairman

GUYTON B. HAYS, Member

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

Case 3470
Heard 9-28-66
Rec. 9-30-66

to Grant Gulf's request for an increase in GOR from 2000:1 to 6000:1 in Justis Blinebry Oil pool.

2. Evidence indicates that no waste will ~~accrue~~ occur by increasing the Gas production of the pool.

[signature]

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. 2986
Order No. R-2691

APPLICATION OF ~~SHELL OIL COMPANY~~
TO ESTABLISH A 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 February 5, 196'. at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 15th day of April, 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, Shell Oil Company, seeks the establishment of a special gas-oil ratio limitation of 5,000 cubic feet of gas for each barrel of oil produced in the ~~Mesa-Queen Pool~~; Lea County, New Mexico.

(3) That approval of the subject application will afford to the owner of each property in the pool the opportunity to produce his just and equitable share of the oil and gas and for this purpose to use his just and equitable share of the reservoir energy.

(4) That approval of the subject application will prevent waste and protect correlative rights provided the flaring or venting of gas in the Mesa-Queen Pool is prohibited.

(5) That in order to assure the protection of correlative rights, the operator of each well in the Mesa-Queen Pool should file a new gas-oil ratio test with the Commission's Hobbs District Office on or before ~~May 31, 1964~~.

12/1/64

IT IS THEREFORE ORDERED:

(1) That, effective May 1, 1964, the limiting gas-oil ratio in the Mesa-Queen Pool, Lea County, New Mexico, shall be 5,000 cubic feet of gas for each barrel of oil produced; that, effective May 1, 1964, each proration unit in the Mesa-Queen Pool shall produce only that volume of gas equivalent to 5,000 multiplied by top unit oil allowable for the pool.

(2) That the operator of each well in the Mesa-Queen Pool shall file a new gas-oil ratio test with the Commission's Hobbs District Office on or before May 31, 1964, and shall furnish a schedule of test dates to the Commission's Hobbs District Office in order that the tests may be witnessed.

(3) That no gas shall be flared or vented in the Mesa-Queen Pool more than 60 days after a well begins to produce or 60 days after the effective date of this order, whichever is later. Any operator desiring to obtain an exception to this provision shall submit to the Secretary-Director of the Commission an application for such exception with a statement setting forth the facts and circumstances justifying it. The Secretary-Director is hereby authorized to approve such an application if he determines that the exception is necessary to prevent waste. If the Secretary-Director declines to grant administrative approval of the requested exception, the matter shall be set for hearing if the operator so requests.

(4) 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, Chairman

E. S. WALKER, Member

S E A L

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

esr/

El Paso Natural Gas Company

El Paso, Texas 79999

'66 SEP 26 AM 7 34

September 22, 1966

New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Re: Case 3470 - Application of Gulf Oil Corporation
for Increased Gas-Oil Ratio Limitation,
Justis Blinebry Pool, Lea County, New Mexico

Gentlemen:

Pursuant to a request from Gulf Oil Corporation in regard to the above captioned case, this is to advise you that El Paso Natural Gas Company has sufficient capacity in its gathering system and treating facilities to handle the additional volumes of gas which Gulf has advised us will be available from the increased ratio limitation.

Yours very truly,

D. H. RAINEY
Assistant Manager
Gas Proration Operations

DHR:vn

cc: Mr. M. I. Taylor
Mr. John Hoover

TEXACO
INC.
PETROLEUM PRODUCTS

DOMESTIC PRODUCING DEPARTMENT
MIDLAND DIVISION

P. O. BOX 3109
MIDLAND, TEXAS 79704

September 22, 1966

File

CASE NO. 3470
JUSTIS (BLINEBRY) POOL
LEA COUNTY, NEW MEXICO

Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico

Attn: Mr. A. L. Porter, Jr.

Gentlemen:

Texaco Inc. concurs with the application of Gulf Oil Corporation to increase the limiting GOR in the Justis (Blinebry) Oil Pool of Lea County, New Mexico from 2,000 cubic feet of gas per barrel of oil to 6,000 cubic feet of gas per barrel of oil. It is respectfully requested that the New Mexico Oil Conservation Commission approve this application.

Texaco Inc. operates 24 wells on 8 leases in the Justis (Blinebry) Oil Pool. The other principal operators in the field are Atlantic-Richfield, operating 18 wells; Gulf Oil Corporation, operating 25 wells; and Union of Texas Petroleum Corporation, operating 24 wells. These four companies operate 54% of the total wells in the pool and will receive approximately 47% of the total production increase that is expected to result from the approval of Gulf's application. It is believed that all of the 22 operators in the subject oil pool will concur in this application.

It is our understanding that the gas purchaser in this pool has already agreed to purchase all additional gas produced resulting from increasing the limiting GOR from 2,000 to 6,000 cubic feet of gas per barrel of oil. Furthermore, our investigations indicate that correlative rights of various operators will be protected with the increased GOR limit. In addition, production history indicates that the increased withdrawals will not be detrimental to reservoir performance. There is little correlation between structure and per-

forated intervals with high GOR's. It appears that gas can be produced from individual sand members throughout the entire vertical section of the productive formation. This indicates that there would be no waste of reservoir energy nor reduction in ultimate recovery by reducing allowable penalties and increasing withdrawals.

Yours very truly,

J. H. Markley
Division Manager

CLW:jl

AMERADA PETROLEUM CORPORATION

P. O. BOX 2040

TULSA, OKLAHOMA 74102

September 21, 1966

File

New Mexico Oil Conservation Commission
State Land Office Building
Santa Fe, New Mexico

Re: Case 3470
September 28, 1966

MAIN OFFICE

'66 SEP 26 AM 10 02

Gentlemen:

Amerada Petroleum Corporation supports application of Gulf Oil Corporation to raise the limiting gas oil ratio of the Justis Blinebry Pool from 2,000 to 6,000 cubic feet per barrel.

Very truly yours,

R. L. Hocker

RLH:pw

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

WESTERN UNION
TELEGRAM

W. P. MARSHALL, President

1201 (6-60)

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

LA140 DC215

D MDA134 PD=MIDLAND TEX 27 333P MST CST= 1966 SEP 27 PM 3 02

NEW MEXICO OIL CONSERVATION COMMISSION,
ATTN A L PORTER JR= PHONE 982-2641 SANTA FE NMEX=

REGARDING CASE #3470 AS AN OPERATOR IN THE JUSTICE BLINEBRY FIELD LEA COUNTY NEW MEXICO, TIDEWATER OIL COMPANY URGES APPROVAL OF GULF'S APPLICATION IN CASE #3470 INCREASING THE GAS-OIL RATION OF THIS FIELD TO 6000:1 THIS NEW GAS-OIL RATIO WOULD NOT ONLY PLACE THIS FIELD IN LIKE WITH OTHER BLINEBRY FIELDS IN SOUTH EASTERN NEW MEXICO BUT BECAUSE OF THE NATURE OF THE JUSTICE LINEBRY RESERVOIR WOULD PERMIT THE GREATEST ULTIMATE RECOVERY=

R H COE=

SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CASE 3464: Application of Continental Oil Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Queen formation through 13 wells located in Sections 3, 4, 9, and 10, Township 20 South, Range 36 East, Eumont Pool, Lea County, New Mexico.

CASE 3465: Application of Amerada Petroleum Corporation for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Jenkins-Cisco Pool underlying the SW/4 of Section 19, Township 9 South, Range 35 East, Lea County, New Mexico.

CASE 3466: Application of Skelly Oil Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of its Lovington Paddock Unit Area comprising 3325 acres, more or less, of Federal, fee and State lands in Townships 16 and 17 South, Ranges 36 and 37 East, Lea County, New Mexico.

CASE 3467: Application of Skelly Oil Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in its Lovington Paddock Unit by the injection of water into the Lovington Glorieta (Paddock) formation through 22 wells located in said unit area, Lovington Paddock Pool, Lea County, New Mexico.

CASE 3468: Application of Tenneco Oil Company for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Grayburg-Jackson West Cooperative Unit Area comprising 2,000 acres, more or less, of State and fee lands in Township 17 South, Range 29 East, Eddy County, New Mexico.

CASE 3469: Application of Gulf Oil Corporation for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of its Springs Unit Area comprising 5,139 acres, more or less, of Federal and fee lands in Township 20 South, Range 26 East, and Township 21 South, Range 25 East, Eddy County, New Mexico.

CASE 3470: Application of Gulf Oil Corporation for a special gas-oil ratio limitation, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an exception to Rule 506 of the Commission Rules and Regulations to provide for a limiting gas-oil ratio of 6000 cubic feet of gas per barrel of oil in the Justis Blinebry Pool, Lea County, New Mexico.

ir/

Docket No. 24-66

DOCKET: EXAMINER HEARING - WEDNESDAY - SEPTEMBER 28, 1966

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 3459: Application of Pennzoil Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Grayburg-San Andres formation through eight wells located in Sections 28 and 33, Township 17 South, Range 33 East, Maljamar Pool, Lea County, New Mexico.

CASE 3460: Application of Penroc Oil Corporation for an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to drill and complete a well at an unorthodox location 1,500 feet from the South and East lines of Section 19, Township 21 South, Range 24 East, Indian Basin-Upper Pennsylvanian Gas Pool, Eddy County, New Mexico. Applicant, upon completion of said well in the Upper Pennsylvanian formation, proposes to abandon its Indian Federal Well No. 1, located in Unit G of said Section 19, insofar as the Upper Pennsylvanian formation only is concerned.

CASE 3461: Application of Cities Service Oil Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of its Southeast Maljamar Grayburg-San Andres Unit Area comprising 1,080 acres, more or less, of State and Federal lands in Sections 29, 30 and 32, Township 17 South, Range 33 East, Lea County, New Mexico.

CASE 3462: Application of Cities Service Oil Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in its Southeast Maljamar Grayburg-San Andres Unit by the injection of water into the Grayburg-San Andres formation through eleven wells located in Sections 29, 30 and 32, Township 17 South, Range 33 East, Lea County, New Mexico.

CASE 3463: Application of Continental Oil Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of its Reed-Sanderson Unit Area comprising 1041 acres, more or less, of Federal and fee lands in Township 20 South, Range 36 East, Lea County, New Mexico.

Gulf Oil Corporation

ROSWELL PRODUCTION DISTRICT

Case 3470

W. B. Hopkins
DISTRICT MANAGER
M. I. Taylor
DISTRICT PRODUCTION MANAGER
F. O. Mortlock
DISTRICT EXPLORATION MANAGER
H. A. Rankin
DISTRICT SERVICES MANAGER

August 29, 1966

P. O. Drawer 1938
Roswell, New Mexico 88201

MAIN OFFICE OCC
'66 AUG 30 PM 1 22

Oil Conservation Commission
State of New Mexico
Post Office Box 2088
Santa Fe, New Mexico 87501

Attention: Mr. A. L. Porter, Jr.

Gentlemen:

Gulf Oil Corporation respectfully requests that an Examiner Hearing be set to consider its application for an exception to the Statewide Rule 506, Gas-Oil Ratio Limitation, for the Justis Blinebry Pool, Lea County, New Mexico. Applicant will request approval to increase the limiting GOR from 2,000 to 6,000 cubic feet per barrel for said pool.

Respectfully submitted,

GULF OIL CORPORATION

M. I. Taylor

JHH:ers

cc: New Mexico Oil Conservation Commission
Post Office Box 1980
Hobbs, New Mexico 88240

DOCKET MAILED
Date 9-15-66

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
September 28, 1966

EXAMINER HEARING

IN THE MATTER OF:

Application of Gulf Oil Corporation for a special gas-oil ratio limitation, Lea County, New Mexico.

Case No. 3470

BEFORE: Elvis A. Utz, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: Case 3470.

MR. HATCH: Application of Gulf Oil Corporation for a special gas-oil ratio limitation, Lea County, New Mexico.

MR. KASTLER: Gulf's witnesses in this case will be Mr. Charles Mace and Mr. J. L. Hutchison.

(Witnesses sworn.)

(Whereupon, Gulf's Exhibits Nos. 1 through 4 were marked for identification.)

MR. JACOBS: Enter the appearance of Ronald Jacobs for Skelly Oil Company.

MR. UTZ: Are there any other appearances?

MR. KASTLER: Will you be giving any testimony?

MR. JACOBS: No, just to support you.

CHARLES E. MACE

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

DIRECT EXAMINATION

BY MR. KASTLER:

Q Please state your name, by whom employed, where, and in which capacity.

A Charles E. Mace, Gulf Oil Corporation, Roswell, New Mexico, District Reservoir Engineer.

Q Have you previously appeared before the New Mexico

Oil Conservation Commission and testified as a petroleum engineer?

A Yes, sir.

Q Please briefly state what Gulf is seeking in this application.

A Gulf is seeking an exception to Commission Rule 506 to provide for a limiting gas-oil ratio of 6,000 cubic feet per barrel for the Justis Blinebry Pool. At a meeting of the technical representatives of the operators in Hobbs, New Mexico on August 25th, 1966, it was unanimously agreed, after reviewing the data pertinent to this field, that a hearing before the Commission should be scheduled requesting this increase in ratio. Eighty-four per cent of the pool's wells were represented at this meeting.

Q Have you prepared exhibits, or a composite exhibit, based upon your studies of the producing characteristics of the Justis Blinebry Pool?

A Yes, sir.

Q Please refer to Exhibit 1 and give a summary of the reservoir and fluid characteristics.

A Briefly, the reservoir and fluid characteristics, the estimated productive area of the entire reservoir, 6800 acres. This is shown on Exhibit 1-A. The average depth to the top of the reservoir is 5300 feet. The average gross

thickness, 600 feet. Average porosity, 3.4%; average horizontal permeability, 2.6 millidarcies, ranging from zero point one to seventy-three millidarcies. The connate water content has not been determined. The gravity of the oil is 38.6° API. Gravity of the gas is 0.8, and the original oil-water contact is unknown.

The original gas-oil contact, the reservoir was saturated at initial conditions and it was originally believed that a gas cap was present. However, subsequent completions tend to indicate that the gas-oil contact is not a fixed datum throughout the pool, and that random occurrence of interbedded dry gas zones is more representative of the reservoir.

The type drive mechanism is primarily solution gas drive with negligible, if any, gas cap expansion. The original reservoir pressure and saturation pressure is measured at 2478 psig at 2300 feet subsea. The reservoir temperature is 100° Fahrenheit. The original gas solubility, 882 cubic feet per barrel. The original oil viscosity, 0.58 centipoises. The original formation volume factor is 1.441.

Q Review production and performance history.

A The reservoir was discovered in March 1958. The reservoir has been developed on a 40-acre spacing pattern. There are 170 wells in the reservoir. The June 1966

statistical report shows 123 flowing wells, 45 artificial lift wells and two shut-in wells, for a total of 170, and then the September 1966 proration schedule shows 37 top allowable wells, 44 capacity wells, 48 penalized wells, 40 non-effective penalized wells, one no-allowable well, for a total of 170.

If you refer to Exhibit 1-A, the area plat, you will notice that some of the 40-acre units have diagonal lines joined through it and others have speckled dots, and the diagonal lines represent the penalized wells on the September, '66 proration schedule, of which there are 48, and the other speckled 40's show the non-effective penalized wells, of which there are 40, so there are a total of 88 of the pool's 170 wells which have high ratios that is higher than 2,000 cubic feet per barrel.

You also notice that they are very well spread out throughout the reservoir, uniformly spread. The history of the pool performance may be seen in Table I and Exhibit 1-C. The stage of depletion of the pool is intermediate. The average daily oil production at the present time, 5,405 barrels or 32 barrels per day per well. The average gas-oil ratio is 3,540 cubic feet per barrel. The water production is 23%, and the cumulative oil production to July 1st, 1966, 7,905,898 barrels. There have been no previous injection permits granted in this reservoir.

Q In view of the prevalence of the penalized well problem, what do Gulf and the majority of the other operators propose to do, or have the Oil Conservation Commission do?

A The requests of Gulf Oil Corporation are these: Production from this pool is obtained primarily by a solution gas drive mechanism. The reservoir was saturated at initial conditions, and it was originally believed that a gas cap was present. Subsequent completions have indicated that the gas-oil contact is not a fixed datum throughout the pool, and that gas production from interbedded dry gas zones may more nearly reflect reservoir conditions. In either case, little if any benefit to the oil reservoir is anticipated due to the low permeability, and more important, the stratified nature of the thick reservoir. The reservoir is in the intermediate stage of depletion and 52 per cent of the wells produce with gas-oil ratios in excess of 2,000 cubic feet per barrel.

Conditions similar to the Justis Blinebry Pool exist in the other two large Blinebry oil pools, the Blinebry and Terry Blinebry Pools, as well as the nearby Fowler Blinebry Pool, and the Commission granted an increase in limiting gas-oil ratio (6,000 cubic feet per barrel) to each.

Based on the September, 1966 proration schedule, a 6,000 cubic feet per barrel limiting ratio would result in an estimated daily increase in pool production of 562 barrels

of oil and 3.5 million cubic feet of gas. El Paso Natural Gas Company has advised that its system can accommodate this increase in gas production, and we understand that they so informed the Commission by letter.

Technical representatives of operators representing 84 per cent of the wells in the pool unanimously agreed at a meeting August 25, 1966 in Hobbs, New Mexico, that an increase in the limiting gas-oil ratio was justifiable.

Therefore, since solution gas drive appears to be the principal drive mechanism and ultimate recovery will not be adversely affected, high gas-oil ratio wells appear typical yet unavoidable in this type reservoir, reservoir energy will still be utilized in a prudent manner consistent with good oil field operating practices, and correlative rights protected, Gulf Oil Corporation respectfully requests an exception to Commission Rule 506 to provide for a limiting gas-oil ratio of 6,000 cubid feet per barrel.

Q Was the composite Exhibit No. 1, with the plat shown at 1-A and the graph on 1-C, all of those prepared by you or at your direction and under your supervision?

A Yes, sir.

MR. KASTLER: This concludes my questions on direct of Mr. Mace. If you would like, Mr. Utz, I could have Mr. Hutchison take the stand now, and he's going to testify

in connection with Exhibit 1-B and further Exhibits 2, 3 and 4, and the cross examination could be deferred until after.

MR. UTZ: Is there more reservoir information?

MR. KASTLER: Yes, it would be more reservoir information.

MR. UTZ: We might as well defer questions. You will be subject to call if there are any questions.

J. L. HUTCHISON

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

DIRECT EXAMINATION

BY MR. KASTLER:

Q Mr. Hutchison, you have previously been a witness before the New Mexico Oil Conservation Commission Examiner's Hearing?

A Yes, I have.

Q And testified as an expert petroleum geologist?

A Yes, I have.

Q What is your position with Gulf?

A I am the District Production Geologist.

Q Have you made studies of the geological features of the Justis Blinebry Pool and have those led you to the structure map contained in Mr. Mace' composite Exhibit 1, labeled Exhibit 1-B?

A Yes, I have.

Q Please refer to Exhibit 1-B now and state what is shown thereon that might be pertinent to the application.

A Exhibit 1-B is a structure map over the Justis Blinebry field, and the southern portion of the Fowler Blinebry Pool. The contour interval is 25 feet and the top is what we call the Blinebry Marker. This marker is approximately 140 feet below the Oil Conservation Commission Blinebry as established in the Amerada No. 4 Wimberly well located in Section 24 of Township 25 South, Range 37 East.

As far as the structure is concerned, it is quite obvious that it is a more or less north-south anticlinal structure with some 250 feet of dip per mile. Over this structure we have prepared three cross sections, east-west cross sections, the northernmost in the southern portion of Township 24 South, Range 37 East being labeled A-A^1. In the central portion of Township 25 South, Range 37 East and 25 South, 38 East, we have a cross section B-B^1. In the southern portion of those two townships we have our third cross section, C-C^1.

Q What is the gross over-all thickness of the Justis Blinebry Pool?

A The over-all thickness of the Blinebry pay as established by the Oil Conservation Commission is 643 feet,

as established in this well, and the thickness is fairly uniform over the entire field.

Q What is the lithology of the rock you are dealing with in this Blinebry section?

A The Blinebry section is primarily a tan to brown, fine to medium crystalline dolomite with occasional inclusions of anhydrite with fractured intercrystalline and some vuggy porosity. In places there are some oolitics in this dolomite section.

Q I would like you to refer now to Exhibit 2 which explains your cross section A to A^1 as shown in Exhibit 1-B; now Exhibit 2 $A-A^1$.

A Yes.

Q Your wells on that exhibit read left to right identical to the wells on Exhibit 1-B, right?

A That is correct. This is the most northern cross section on Exhibit 1-B.

Q Go ahead and explain it.

A As far as the structure map, I stated a while ago that the marker on the structure map was approximately 140 feet below the O. C. C. Blinebry, and I noted on the west side of each one of these cross sections so that you would know what the mapping point is. The most northern cross section, $A-A^1$, I have noted the top of the Glorieta,

the top of the Blinebry, and the top of the Tubb or the base of the Blinebry formation. You can note that the section is rather long and some 640 feet, and on these wells I have shown perforations where these wells were completed, and down on the base here showing the IP's and so forth.

Q What have you shown in the event there were remedial perforations or remedial work carried on?

A Well, on the left side of the center column I have perforations showing the original perforations, and then if the remedial work was performed, I have them noted on the right-hand side of the center column of the logs.

Q In general, what do they indicate in A-A^1?

A Well, the main purpose of these cross sections are to show this 640 section, the various zones that are perforated in this Blinebry formation, and how the GOR's in this section do not necessarily conform to the datums, and so forth, that we are completed in. This first cross section is an example, the well, the farthest most on the east, the Texaco Erwin NCT 2 No. 5 was originally perforated here at a 5492 to 5539. That well IP'd for 124 barrels of oil with a GOR of 56,590 cubic feet per barrel. While the east offset, the Texaco "B" NCT 2 No. 4 well was perforated at a 54 to 5616 and completed for a GOR, it was excessive, of 7160; and being roughly in the equivalent section of this well and

subsequently the well was perforated even higher than the original perforations and treated, and they reduced their GOR down to a 5212, and I think probably from these perforations, original upper perforations, they may be hard to note from there, but I am just trying to show the various methods and zones that are completed in the Blinebry formation. This well here was a dry hole.

Q In general, Mr. Hutchison, can you conclude that there are irregularities in this cross section A-A^1, which, in fact, preclude any uniform gas-oil contact in this part of the Justis-Blinebry Pool?

A Yes, I think it is very erratic porosity and permeability and I think in a lot of cases, as noted particularly on those two wells of Texaco's on the right there, that the datum bases for perforation do not necessarily mark the GOR of the well.

Q Now, taking the cross section you have made on the middle segment of the Blinebry Pool --

A Yes.

Q -- B-B^1, will you explain what is of interest in there?

A Cross Section B-B^1 is the same as A in that we show the original perforations on the left, remedial on the right. This goes over, this is a longer cross section, had

more well control, and in these wells you will note two Gulf wells here that are offset, which this will be the Gulf McBuffington No. 6, will be the third well from the right on the cross section, and the Gulf Oil No. 4 McBuffington, the fourth well from the right on the cross section.

I would like to show the original perforations in these wells. The original perforations in the Well No. 4 was from a 5134 down to a 5547. In the No. 6 well, the original perforations were from a 5158 to a 5598. Datumwise on the No. 6 well, that is the minus 2,074 to a minus 2,514 subsea. On the No. 4 well, that is a minus 2,043 to a minus 2,456, and on the original completion on these wells, they are relatively flat, there's not much difference in the datum perforations or in the structure of the two wells.

The No. 4 well completed flowing 206 barrels of oil with a GOR of 10,218, while the offset well in practically the same interval IP'd flowing 672 barrels of oil with a GOR of 916 barrels per cubic feet per barrel of oil.

Q Throughout the rest of this --

A Others here, they are noted and so forth, and you can see the same as this variance in the place that the people have completed and remedial work on the wells.

Q So Exhibit No. 3, which is B-B^1, then, further shows the erratic nature of the reservoir in the middle

segment of its body?

A That is correct.

Q Now, C-C^1, which is Exhibit 4.

A C-C^1, some other wells than this well over to the right, we will not make any comment other than show --

Q Can you identify it?

A That is the Leonard Oil Company No. 9 Ginsberg Federal. The second well from the right is the Gulf Oil Corporation Arnott Ramsey NCT "F" No. 5. This well was originally completed from perforations 5231 to 5467, with a GOR of 483. Subsequently, the upper two sets of perforations were squeezed in this well and on the IP, the GOR, remedial IP, the GOR was 2,090, which isn't very much excessive. The most extreme well to the west, the Cactus Federal No. 1-35, was originally completed from 5,064 to 5,084 in the very upper portion of the Blinebry formation and it potentialed flowing 85 barrels of oil with a GOR of 951.

Subsequently they perforated below that, well, 150 feet or so from the next perforation down, and on an IP flowed 27 barrels of oil with GOR of 1906, so even going down the section they increased their GOR from the original completion.

Q Now, from Exhibit No. 4, do you find evidence of further erratic nature of the reservoir in the southerly portion of the pool?

A Yes, I do.

Q Were Exhibits 1-B, 2, 3 and 4 prepared by you or at your direction and under your supervision from true logs here?

A Yes, they were.

MR. KASTLER: I would like to move for the admission of all exhibits at this time, 1 and 2, 3 and 4, composite 1, 2, 3 and 4.

MR. UTZ: Without objection the Exhibits 1 through 4 will be entered into the record in this case.

(Whereupon, Gulfs' Exhibits 1 through 4 were offered and admitted in evidence.)

Q (By Mr. Kastler) Do you have a concluding statement that you would like to make, Mr. Hutchison?

A Well, from the study of these logs, looking at the wells, and so forth, it is my contention that the determining factor throughout this thick Blinebry section, some 640 feet, is that the variance in permeabilities and porosities determine to a great degree the GOR limits within the producing wells.

Q And you don't find any evidence of an established gas-oil contact?

A No, sir, I do not.

Q And you conclude that the drive mechanism is

solution gas, most likely?

A Yes, sir.

MR. KASTLER: This concludes my questions on direct.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Hutchison, would there be a possibility in this reservoir of numerous gas caps in the various zones?

A There could be, I think there could be. I would say that in isolated areas within that you could have zones that would have more gas than others, and they could possibly accumulate on small structure, as you note from the structure map on the cross section. As far as trying to definitely decide the gas-oil contact within this section, and that is my opinion along with the people that we got together with, the other operators in this field, that was their consensus of opinion also.

Q Actually, as I understand, or if I understand your testimony, this is really a series of reservoirs, all quite small?

A Yes, sir, I would think you could say that maybe that you could have several small, isolated reservoirs. I wouldn't even say how many, I mean, but where you have erratic nature of porosities and permeabilities, and so forth,

they possibly could act as numerous reservoirs, they extend from the north end to the south end of the Justis-Blinebry Pool.

Q Because their vertical limits of each of these possible reservoirs would be so small, it would be impractical in your opinion to try to determine where and if there were any small, isolated gas caps?

A Oh, yes, sir. I would definitely think it would be almost impossible to determine it.

Q By raising the GOR--first let me ask, is there some isolated zones or do you know of isolated zones within the vertical limits of this reservoir which are virtually all gas?

A I don't know of any; I would say they are all gas in the Justis-Blinebry.

Q Some with high GOR's?

A Yes, some very high GOR's.

Q Some very extremely low GOR's?

A Yes, some very low. I don't know what they range. I think the highest was the Texaco well on the Exhibit A-A. The highest was 56,000. There's some down here, for instance, 352, so there is considerable variation within the GOR's in the IP.

Q In your opinion, you don't feel that this would be

detrimental to these zones which have low solution GOR's?

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

Q Do you have any idea about what other variation in pressures are between the top and the bottom between the various zones? It's probably all the same now.

A No, sir, I sure don't. We had original pressures, but I don't know of any variations of pressures within the reservoir.

Q In your opinion, you don't believe then that there will be any loss of oil by producing the gas at a higher rate?

A No, sir. I would think that we would get about the same amount of oil.

MR. UTZ: Are there any other questions?

REDIRECT EXAMINATION

BY MR. KASTLER:

Q I take it that it is your opinion because of these reservoir characteristics, that the reservoir is not rate sensitive to production?

A That is correct. You get about as much as whatever rate you take it at, correct.

Q Is it your opinion that this Justis-Blinebry Pool might shortly be connected with the Fowler-Blinebry?

A Well, going by Fowler spacing, right now we have two diagonal offsets on the spacing, it's that close already;

and one more well would put it on 40-acre spacing.

Q And the gas-oil ratio in the Fowler-Blinebry has been increased to 6,000 to one?

A Yes, that is correct.

MR. KASTLER: Would you like to interrogate Mr. Mace on cross examination?

MR. UTZ: I have no questions. Does anyone else have any further questions of either of these witnesses? They may be excused.

(Witnesses excused.)

MR. UTZ: Any statements in this case?

MR. JACOBS: Yes. Ronald Jacobs appearing for Skelly Oil Company. We support the application of Gulf in this cause and urge the Commission to enter its order increasing the ratio to 6,000.

MR. UTZ: Any other statements?

MR. HATCH: Yes, there's a telegram.

MR. UTZ: As soon as I get this folded up I'll find it.

MR. HATCH: A telegram from Tidewater and letters from Texaco and Amerada in support of the application. A letter from El Paso Natural Gas stating that they do have the capacity to handle any additional gas.

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

I N D E X

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 27th day of October, 1966.

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. 3470, heard by me on Sept. 25, 1966.

....., Examiner
New Mexico Oil Conservation Commission

EXHIBIT 1

DATA FOR CASE 3470

AN EXCEPTION TO COMMISSION RULE 506

TO PROVIDE FOR A LIMITING GAS-OIL RATIO OF 6,000 CF/B

JUSTIS BLINEBRY POOL

LEA COUNTY, NEW MEXICO

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
Gulf EXHIBIT NO. 1, 1a, 1b, 1c
CASE NO. 3470

EXAMINER HEARING

NEW MEXICO OIL CONSERVATION COMMISSION

SEPTEMBER 28, 1966

GULF OIL CORPORATION

ROSWELL DISTRICT

DATA FOR CASE 3470

APPLICATION TO COMMISSION RULE 506
TO PROVIDE FOR A LIMITING GAS-OIL RATIO OF 6,000 CF/B

EXAMINER HEARING

SEPTEMBER 28, 1966

Pool Justis Blinebry County Lea

INFORMATION ON ENTIRE RESERVOIR

I. RESERVOIR AND FLUID CHARACTERISTICS

1. Name of Reservoir Blinebry
2. Estimated Productive Area of Entire Reservoir 6,800 acres (See Exhibit 1-A
3. Lithology of Reservoir Rock Brown, crystalline dolomite with inclusions of anhydrite. The formation is fractured and exhibits intercrystalline and vuggy porosity, occasionally oolitic in places.
4. Structure North-south trending anticline with a dip of approximately 200 feet per mile. (See Exhibits 1-B and 2)
5. Average Depth to Top of Reservoir 5,300 feet
6. Average Gross Thickness 600 feet
7. Average Porosity 3.4%
8. Average Horizontal Permeability 2.6 millidarcies
   Range 0.1 - 73.0 millidarcies
9. Connate Water Content (% of Pore Space) Not determined
10. Gravity of Oil 38.6° API Gravity of Gas 0.8
11. Original Oil-Water Contact Unknown
12. Original Gas-Oil Contact The reservoir was saturated at initial conditions and it was originally believed that a gas cap was present. However, subsequent completions tend to indicate that the gas-oil contact is not a fixed datum throughout the pool and that random occurrence of interbedded dry gas zones is more representative of the reservoir.

13. Type Drive Mechanism Primarily solution gas drive with negligible, if any, gas cap expansion.

14. Original Reservoir Pressure and Saturation Pressure 2,478 psig @ -2,300' subsea.

15. Reservoir Temperature 100° F

16. Original Gas Solubility 382 CF/B

17. Original Oil Viscosity 0.58 centipoises

18. Original Formation Volume Factor 1.441

II. PRODUCTION AND PERFORMANCE HISTORY

1. Discovery Date March, 1958

2. Spacing Pattern 40 acres

3. Number of Wells in the Reservoir and their Status

June 1966 Statistical Report		September 1966 Proration Schedule	
No. Flowing Wells	123	No. Top Allowable Wells	37
No. Artificial Lift Wells	45	No. Capacity Wells	44
No. Wells Shut-In	2	No. Penalized Wells	48
	170	No. Non-Effective Penalized Wells	40
		No. No-Allowable Wells	1
			170

4. Pool Performance History See Table I and Exhibit 1-C for oil, water, gas-oil ratio and reservoir pressure history.

5. Stage of Depletion of Pool Intermediate

6. Average Daily Oil Production at Present Time 5,405 Bbls. (32 B/D/W)

7. Average Gas-Oil Ratio 3,540 CF/B Water Production 23%

8. Cumulative Oil Production to July 1, 1966 7,905,898 Bbls.

9. Injection Permits Previously Granted in this Reservoir None

III. REQUESTS OF GULF OIL CORPORATION

Production from this pool is obtained primarily by a solution gas drive mechanism. The reservoir was saturated at initial conditions, and it was originally believed that a gas cap was present. However, subsequent completions

have indicated that the gas-oil contact is not a fixed datum throughout the pool, and that gas production from interbedded dry gas zones may more nearly reflect reservoir conditions. In either case, little if any benefit to the oil reservoir is anticipated due to the low permeability, and more important, the stratified nature of the thick reservoir. The reservoir is in the intermediate stage of depletion and 92 per cent of the wells produce with gas-oil ratios in excess of 2,000 CF/B.

Conditions similar to the Justis Blinebry Pool exist in the other two large Blinebry oil pools, the Blinebry and Terry Blinebry Pools, as well as the nearby Fowler Blinebry Pool, and the Commission granted an increase in limiting gas-oil ratio (6,000 CF/B) to each.

Based on the September, 1966 proration schedule, a 6,000 CF/B limiting ratio would result in an estimated daily increase in pool production of 562 barrels of oil and 3.5 MMCF of gas. El Paso Natural Gas Company has advised that its system can accommodate this increase in gas production, and we understand that they so informed the Commission by letter.

Technical representatives of operators representing 84 per cent of the wells in the pool unanimously agreed at a meeting August 25, 1966 in Hobbs, New Mexico, that an increase in the limiting gas-oil ratio was justifiable.

Therefore, since solution gas drive appears to be the principal drive mechanism and ultimate recovery will not be adversely affected, high gas-oil ratio wells appear typical yet unavoidable in this type reservoir, reservoir energy will still be utilized in a prudent manner consistent with good oil field operating practices, and correlative rights protected, Gulf Oil Corporation respectfully requests an exception to Commission Rule 506 to provide for a limiting gas-oil ratio of 6,000 CF/B.

TABLE I

PERFORMANCE HISTORY
JUSTIS BLINEBRY POOL
LEA COUNTY, NEW MEXICO

Month and Year	Oil Production Bbls	Per Cent Water Produced	Producing GOR CF/B	Reservoir Pressure @ -2300' PSIG	Number of Wells
1958					
Mar.	370			2,478	1
Apr.	2,290				1
May					
Jun.					
Jul.	1,192				1
Aug.	1,457				1
Sept.	1,467				1
Oct.	2,722		4,476		2
Nov.	2,334		5,116		2
Dec.	2,423		5,631		2
Yearly Total	14,255				
Cumulative	14,255				
1959					
Jan.	3,957	12	4,056		3
Feb.	6,243	7	3,759		7
Mar.	5,145	10	7,924		7
Apr.	7,883	8	5,253		10
May	10,596	8	3,415		10
Jun.	10,707	8	2,251		9
Jul.	15,792	7	3,152		15
Aug.	16,438	7	3,983		16
Sept.	17,763	3	2,730		19
Oct.	21,395	4	2,764		20
Nov.	24,054	5	2,668		20
Dec.	28,051	5	2,416		22
Yearly Total	168,024				
Cumulative	182,279				
1960					
Jan.	36,369	5	2,297		29
Feb.	36,023	8	2,094		31
Mar.	42,358	9	1,981		31
Apr.	36,767	7	1,718		32
May	40,984	8	1,604		35
Jun.	38,169	8	1,869	1,813	36
Jul.	41,431	9	1,542		37
Aug.	47,823	10	1,873		38
Sept.	49,650	8	1,744		44
Oct.	52,318	8	1,688		47
Nov.	53,416	7	1,792		47
Dec.	54,445	9	1,839		48
Yearly Total	529,753				
Cumulative	712,032				

Month and Year	Oil Production Bbls	Per Cent Water Produced	Producing GOR CF/B	Reservoir Pressure @ -2300' PSIG	Number of Wells
1961					
Jan.	61,490	10	1,785		50
Feb.	55,704	10	1,803		50
Mar.	58,166	11	1,970		50
Apr.	57,755	12	2,115		51
May	61,544	9	2,295		52
Jun.	54,885	12	2,438	1,655	53
Jul.	52,994	11	2,357		54
Aug.	64,180	10	2,618		56
Sept.	55,179	10	2,476		56
Oct.	63,471	14	2,322		59
Nov.	64,173	10	2,234		60
Dec.	66,807	10	2,203		61
Yearly Total	716,348				
Cumulative	1,428,380				
1962					
Jan.	75,213	12	2,175		66
Feb.	66,119	10	2,204		67
Mar.	74,223	10	2,364		71
Apr.	72,410	12	2,735		74
May	75,788	10	2,756		74
Jun.	68,941	10	3,000	1,503	77
Jul.	74,782	9	2,823		80
Aug.	77,471	12	2,800		85
Sept.	82,850	11	3,118		85
Oct.	80,234	15	2,767		85
Nov.	86,989	15	2,694		90
Dec.	92,694	17	2,571		92
Yearly Total	927,714				
Cumulative	2,356,094				
1963					
Jan.	94,472	18	2,332		97
Feb.	91,704	18	2,501		98
Mar.	102,655	16	2,487		103
Apr.	101,926	19	2,590		109
May	111,124	16	2,618		114
Jun.	110,964	19	2,674	1,583	114
Jul.	116,694	18	2,575		116
Aug.	123,496	17	2,723		118
Sept.	113,289	17	2,589		118
Oct.	120,506	16	2,627		121
Nov.	122,157	18	2,389		124
Dec.	129,584	17	2,252		125
Yearly Total	1,338,571				
Cumulative	3,694,665				

Month and Year	Oil Production Bbls	Per Cent Water Produced	Producing GOR CF/B	Reservoir Pressure @ -2300' PSIG	Number of Wells
1964					128
Jan.	134,771	15	2,369		129
Feb.	130,137	17	2,483		130
Mar.	135,896	16	2,706		131
Apr.	131,890	15	2,854		134
May	132,672	31	3,012		136
Jun.	124,549	30	2,963	1,465	139
Jul.	128,648	29	3,243		142
Aug.	129,965	14	3,273		142
Sept.	131,024	13	3,017		144
Oct.	130,999	19	2,951		144
Nov.	134,392	21	2,736		146
Dec.	144,048	20	2,708		
Yearly Total	1,588,991				
Cumulative	5,283,656				
1965					147
Jan.	143,629	21	2,835		148
Feb.	133,477	21	2,762		150
Mar.	142,943	21	2,817		152
Apr.	140,221	18	3,092		152
May	145,863	19	3,343		154
Jun.	134,239	19	3,350		156
Jul.	137,759	22	3,259		157
Aug.	142,622	27	3,468		159
Sept.	136,609	27	3,326		159
Oct.	145,808	27	3,225		162
Nov.	139,351	28	3,148		163
Dec.	143,295	27	3,361		
Yearly Total	1,685,816				
Cumulative	6,969,472				
1966					164
Jan.	147,551	28	3,141		165
Feb.	143,049	24	3,241		167
Mar.	161,849	22	3,208		167
Apr.	157,232	24	2,974		170
May	164,599	22	3,396		170
Jun.	162,146	23	3,540		