CASE 3351: Application of PAN AM. for special rules for the DOS HERMANOS MORROW GAS POOL.

CASE No.

3351

Application,

Transcripts,

Small Exhibits

ETC.

RESERVOIR DATA

PAN AMERICAN'S EMPEROR OIL CO. FED. GAS COM. NO. 1
DOS HERMANOS - MORROW GAS POOL
EDDY COUNTY, NEW MEXICO

Gross Perforations	
Estimated Net Effective Pay	43'
Average Porosity	14'
Est. Water Sat. (from logs)	7.3%
Producing Mechanism	25%
Lithology	Pressure Depletion
Gas-Water Contact	Medium to coarse grain angular quartz sandstone
Reservoir Temperature	Not Defined
Recoverable Gas	176° F
Bottom Hole Pressures At -8889 Datum	550 MCF/AC.-Ft.

Date	Pressure
8/4/65	5,104
11/3/65	4,837
1/26/66	4,764
7/18/66	4,606
10/19/67	4,037

Cumulative Produced Gas-Liquid Hydrocarbon Ratio	130.3 MCF/Bbl

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
PAN AM EXHIBIT NO. 3
CASE NO. 3351

PRODUCTION DATA
DOS HERMANOS MORROW GAS POOL
PAN AMERICAN'S EMPEROR OIL COMPANY FEDERAL GAS COM. WELL NO. 1
EDDY COUNTY, NEW MEXICO

MONTH	MONTHLY GAS PRODUCTION (MCF)	CUMULATIVE GAS PRODUCTION (MCF)	CONDENSATE PRODUCTION (BBLS)	CUMULATIVE COND. PROD. (BBLS)
1965				
May	136	136	391	391
June	17,580	17,716	146	537
July	19,560	37,276	94	631
August	36,321	73,597	492	1,123
September	90,264	163,861	787	1,910
October	98,473	262,334	753	2,663
November	33,965	296,299	155	2,818
December	17,765	314,064	99	2,917
1966				
January	17,467	331,531	90	3,007
February	9,158	340,689	148	3,155
March	44,843	385,532	497	3,652
April	52,317	437,849	441	4,093
May	54,689	492,538	486	4,579
June	59,907	552,445	487	5,066
July	48,537	600,982	430	5,496
August	57,188	658,170	526	6,022
September	54,160	712,330	411	6,433
October	45,854	758,184	327	6,760
November	39,182	797,366	143	6,903
December	44,292	841,658	358	7,261
1967				
January	106,743	948,401	568	7,829
February	77,055	1,025,456	547	8,376
March	57,150	1,082,606	619	8,995
April	62,680	1,145,286	259	9,254
May	97,534	1,242,820	418	9,672
June	52,300	1,295,120	406	10,078
July	86,735	1,387,355	660	10,738
August	91,697	1,473,552	698	11,436
September	93,720	1,567,272	631	12,067
October	43,818	1,611,090	289	12,356
November	36,758	1,647,848	290	12,646

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
PAN AM EXHIBIT NO. 8
CASE NO. 3351

8

PERTINENT COMPLETION DATA

PAN AMERICAN'S EMPEROR OIL CO. FED. GAS COM. NO. 1
DOS HERMANOS - MORROW GAS POOL
EDDY COUNTY, NEW MEXICO

LOCATION	Unit F, 1980' FN x WL. Sec. 28. T-20-S, R-30-E, Eddy Co., New Mexico
TOTAL DEPTH	13,605'
PLUGBACK DEPTH	12,825'
ELEVATION	3359' RDB
PRODUCTION CASING STRING	7" Set at 13,375'
MORROW PERFORATIONS	12,242-52', 12340-51', 12,362-73', 12,376-81', 12,385-91'
MORROW STIMULATION	None
POTENTIAL	CAOF (4-Point) 13.6 MMCFD, 5-1-65
GAS SALES CONNECTION	6-7-65 (Southern Union)
PRESENT GAS PURCHASER	Potash Company of American
GAS GRAVITY	0.612
ORIGINAL GAS-LIQUID HYDROCARBON RATIO	66.6 MCF/Bbl.
LIQUID HYDROCARBON GRAVITY	51° API at 60° F

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
PanAm EXHIBIT NO. 9
CASE NO. 3351

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. 3351
Order No. R-3022-B

APPLICATION OF PAN AMERICAN PETROLEUM
CORPORATION FOR SPECIAL POOL RULES FOR
THE DOS HERMANOS-MORROW GAS POOL, EDDY
COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on February 7, 1968, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 12th day of February, 1968, 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 by Order No. R-3022, dated December 22, 1965, temporary Special Rules and Regulations were promulgated for the Dos Hermanos-Morrow Gas Pool, Eddy County, New Mexico.

(3) That by Order No. R-3022-A, dated December 9, 1966, said temporary Special Rules and Regulations were continued in full force and effect for an additional 14-month period.

(4) That pursuant to the provisions of Order No. R-3022-A, this case was reopened to allow the operators in the subject pool to appear and show cause why the Dos Hermanos-Morrow Gas Pool should not be developed on 320-acre spacing units.

(5) That the evidence establishes that one well in the Dos Hermanos-Morrow Gas Pool can efficiently and economically drain and develop 640 acres.

(6) That the Special Rules and Regulations promulgated by Orders Nos. R-3022 and R-3022-A have afforded and will afford to the owner of each property in the pool the opportunity to produce his just and equitable share of the gas in the pool.

(7) That in order to prevent the economic loss caused by the drilling of unnecessary wells, to avoid the augmentation of risk arising from the drilling of an excessive number of wells, to prevent reduced recovery which might result from the drilling of too few wells, and to otherwise prevent waste and protect correlative rights, the Special Rules and Regulations promulgated by Orders Nos. R-3022 and R-3022-A should be continued in full force and effect until further order of the Commission.

IT IS THEREFORE ORDERED:

(1) That the Special Rules and Regulations governing the Dos Hermanos-Morrow Gas Pool, promulgated by Orders Nos. R-3022 and R-3022-A, are hereby continued in full force and effect until further order of the Commission.

(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

DAVID F. CARGO, Chairman

GUYTON B. HAYS, Member

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

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. 3351
Order No. R-3022-A

APPLICATION OF PAN AMERICAN PETROLEUM
CORPORATION FOR SPECIAL POOL RULES FOR
THE DOS HERMANOS-MORROW GAS POOL, EDDY
COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on December 7, 1966, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 9th day of December, 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 by Order No. R-3022, dated December 22, 1965, temporary Special Rules and Regulations were promulgated for the Dos Hermanos-Morrow Gas Pool, Eddy County, New Mexico.

(3) That pursuant to the provisions of Order No. R-3022, this case was reopened to allow the operators in the subject pool to appear and show cause why the Dos Hermanos-Morrow Gas Pool should not be developed on 320-acre spacing units.

(4) That the temporary Special Rules and Regulations for the Dos Hermanos-Morrow Gas Pool, promulgated by Order No. R-3022, should be continued in effect for an additional period of time in order to allow the operators in the subject pool

sufficient time to gather additional information concerning the reservoir characteristics of the pool.

(5) That this case should be reopened at an examiner hearing in February, 1968, at which time the applicant and all interested parties should appear and show cause why the Dos Hermanos-Morrow Gas Pool should not be developed on 320-acre spacing units.

IT IS THEREFORE ORDERED:

(1) That the temporary Special Rules and Regulations for the Dos Hermanos-Morrow Gas Pool, promulgated by Order No. R-3022, are hereby continued in full force and effect until further order of the Commission in this case.

(2) That this case shall be reopened at an examiner hearing in February, 1968, at which time the applicant and all interested parties may appear and show cause why the Dos Hermanos-Morrow Gas Pool should not be developed on 320-acre spacing units.

(3) 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

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. 3351
Order No. R-3022

APPLICATION OF PAN AMERICAN PETROLEUM
CORPORATION FOR SPECIAL POOL RULES FOR
THE DOS HERMANOS-MORROW GAS POOL, EDDY
COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on December 14, 1965, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 22nd day of December, 1965, 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, Pan American Petroleum Corporation, seeks the promulgation of temporary special rules and regulations for the Dos Hermanos-Morrow Gas Pool in Section 28, Township 20 South, Range 30 East, NMPM, Eddy County, New Mexico, including a provision for 640-acre spacing units and fixed well locations.

(3) That in order to prevent the economic loss caused by the drilling of unnecessary wells, to avoid the augmentation of risk arising from the drilling of an excessive number of wells, to prevent reduced recovery which might result from the drilling of too few wells, and to otherwise prevent waste and protect correlative rights, temporary special rules and regulations providing for 640-acre spacing units should be promulgated for the Dos Hermanos-Morrow Gas Pool.

(4) That the temporary special rules and regulations should provide for limited well locations in order to assure orderly development of the pool and protect correlative rights.

(5) That the temporary special rules and regulations should be established for a one-year period in order to allow the operators in the subject pool to gather reservoir information to establish the area that can be efficiently and economically drained and developed by one well.

(6) That this case should be reopened at an examiner hearing in December, 1966, at which time the operators in the subject pool should be prepared to appear and show cause why the Dos Hermanos-Morrow Gas Pool should not be developed on 320-acre spacing units.

IT IS THEREFORE ORDERED:

That temporary Special Rules and Regulations for the Dos Hermanos-Morrow Gas Pool are hereby promulgated as follows:

SPECIAL RULES AND REGULATIONS
FOR THE
DOS HERMANOS-MORROW GAS POOL

RULE 1. Each well completed or recompleted in the Dos Hermanos-Morrow Gas Pool or in the Morrow formation within one mile thereof, and not nearer to or within the limits of another designated Morrow gas pool, shall be spaced, drilled, operated, and produced in accordance with the Special Rules and Regulations hereinafter set forth.

RULE 2. Each well shall be located on a standard unit containing 640 acres, more or less, consisting of a governmental section.

RULE 3. The Secretary-Director of the Commission may grant an exception to the requirements of Rule 2 without notice and hearing when an application has been filed for a non-standard unit and the unorthodox size or shape of the unit is necessitated by a variation in the legal subdivision of the United States Public Lands Survey, or the following facts exist and the following provisions are complied with:

(a) The non-standard unit consists of quarter-quarter sections or lots that are contiguous by a common bordering side.

(b) The non-standard unit lies wholly within a governmental section and contains less acreage than a standard unit.

(c) The applicant presents written consent in the form of waivers from all offset operators and from all operators owning interests in the section in which the non-standard unit is situated and which acreage is not included in said non-standard unit.

(d) In lieu of paragraph (c) of this rule, the applicant may furnish proof of the fact that all of the aforesaid operators were notified by registered or certified mail of his intent to form such non-standard unit. The Secretary-Director may approve the application if no such operator has entered an objection to the formation of such non-standard unit within 30 days after the Secretary-Director has received the application.

RULE 4. Each well shall be located no nearer than 1650 feet to the outer boundary of the section and no nearer than 330 feet to any governmental quarter-quarter section line.

RULE 5. The Secretary-Director may grant an exception to the requirements of Rule 4 without notice and hearing when an application has been filed for an unorthodox location necessitated by topographical conditions or the recompletion of a well previously drilled to another horizon. All operators offsetting the proposed location shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Secretary-Director may approve the application upon receipt of written waivers from all operators offsetting the proposed location or if no objection to the unorthodox location has been entered within 20 days after the Secretary-Director has received the application.

IT IS FURTHER ORDERED:

(1) That the effective date of this order shall be January 1, 1966.

(2) That the locations of all wells presently drilling to or completed in the Dos Hermanos-Morrow Gas Pool or in the Morrow

formation within one mile thereof are hereby approved; that the operator of any well having an unorthodox location shall notify the Artesia District Office of the Commission in writing of the name and location of the well on or before January 15, 1966.

(2) That the operator of each well presently drilling to or completed in the Dos Hermanos-Morrow Gas Pool or in the Morrow formation within one mile thereof shall file a new Form C-102 dedicating 640 acres to the well on or before January 15, 1966, or shall institute proceedings to obtain a non-standard unit for said well.

(3) That this case shall be reopened at an examiner hearing in December, 1966, at which time the operators in the subject pool may appear and show cause why the Dos Hermanos-Morrow Gas Pool should not be developed on 320-acre spacing units.

(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

esr/

GOVERNOR
DAVID F. CARGO
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
GUYTON B. HAYS
MEMBER

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

P. O. BOX 2088
SANTA FE

February 12, 1968

Mr. Charles Malone
Atwood & Malone
Attorneys at Law
Post Office Box 700
Roswell, New Mexico 88201

Re: Case No. 3351
Order No. R-3022-B
Applicant:
Pan American

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

ALP/ir

Carbon copy of order also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC
Other

Case 3351
Heard 2-7-68
Rec. 2-7-68.

Grant Pan Am. a permanent order for 640 A. spacing for the Dos Hermanos - Morrow Gas pool. Order R-3022.
Data shows the well is draining at least 640.

— [signature]

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
February 7, 1968
EXAMINER HEARING

In the matter of Case No. 3351 being reopened pursuant to the provisions of Order No. R-3022-A, which order extended 640-acre spacing units for the Dos Hermanos-Morrow Gas Pool, Lea County, New Mexico, for a period of 14 months.

Case No. 3351

BEFORE: Elvis A. Utz, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: Case 3351.

MR. HATCH: Case 3351. In the matter of Case No. 3351 being reopened pursuant to the provisions of Order No. R-3022-A, which order extended 640-acre spacing units for the Dos Hermanos-Morrow Gas Pool, Lea County, New Mexico, for a period of 14 months.

MR. MALONE: May it please the Commission, Charles Malone of Atwood & Malone of Roswell, for Pan American. We have one witness, Dave Newman and nine exhibits.

(Witness sworn)

(Whereupon, Applicant's Exhibits 1 through 9 marked for identification)

E. D. NEWMAN

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

DIRECT EXAMINATION

BY MR. MALONE:

Q Please state your name and address?

A E. D. Newman, Fort Worth, Texas.

Q What is your position with Pan American Petroleum?

A I am a Petroleum Engineer.

Q You took a B. S. Degree in Mechanical Engineering at Texas Tech and you have previously testified before this Commission, is that correct?

A Yes, sir, it is.

MR. MALONE: Are the qualifications of the witness satisfactory to the Examiner?

MR. UTZ: Yes, sir, they are.

Q Does the Fort Worth office in which you work have jurisdiction over the area described as the Dos Hermanos Pool Area?

A Yes, sir, we do.

Q Very briefly, what does Pan American seek by its appearance in this case?

A Pan American seeks to make the current temporary pool rules, which include 640-acre spacing in limited well locations permanent.

Q Would you go now to your Exhibit Number 1 and describe what it contains, please, sir?

A All right. Exhibit Number 1 is a map of the Dos Hermanos Pool Area. Shown on this map is the Pan American operated Emperor Federal Well Number 1. It's shown by a red arrow. This is the only well producing in the Dos Hermanos-Morrow Gas Pool. Also to the left side of the exhibit you will see Odessa Natural's Dooley Federal Well Number 1 in the Getty Deep Unit. This well produced for a time from the Morrow Formation, has been abandoned now. In the upper right hand corner, you will see Pan American's Big Eddy Well Number 3,

Big Eddy Unit Well Number 3, which tested the Morrow Formation but was unsuccessful in obtaining commercial production. At the bottom of the exhibit below the Pan American operated Emperor Federal Number 1, two wells appear, one in Section 33, labeled Well Number 2. This well was not drilled to a sufficient depth to test the Morrow Formation. In Section 32 Stokes Yates Staked Number 1 did go deep enough to test the Morrow Formation on drillstem test, but determined it to be non-commercial because it did not give up any appreciable gas on the drillstem test. Also you will see a green line on this exhibit labeled A, A', this is the trace of the structural cross section that will be entered as another exhibit.

Q For purposes of clarity, the distance from the Pan American well in the Dos Hermanos Pool to the Odessa Natural well on the left side is 3.4 miles, is that correct?

A Yes, sir, that is correct.

Q And the distance shown on the other green line or measured there to the Pan American well, which you will have to give me the name of again, is how many miles?

A The distance to Pan American's Big Eddy Number 3 is approximately 5.7 miles.

Q Anything further on this exhibit?

A No, sir.

Q What does Exhibit 2 show, please, sir?

A Exhibit Number 2 is a structural cross section, is outlined by this green line. I believe if we can unfold this from the bottom that perhaps we can see enough of it. I will apologize for the size, it's somewhat unwieldy.

It shows the top, again the three wells that are shown on the map, Odessa Natural Dooley Federal Number 1, Pan American's Emperor Oil Company Federal Number 1, Pan American's Big Eddy Well Number 3. Also depicted on the cross section are the top of the Strawn Formation, the top of the Atoka Formation, the top of the Morrow Formation, and the top of the Barnett Shale, which is at the base of the Morrow Formation. Also shown are drillstem tests run on these wells. In the center margin are the logs on the wells. You will see colored in red perforations which were either used to complete in the Morrow or used to test the Morrow Formation. Beginning with Odessa Natural's Dooley Federal Number 1 on the lefthand side, this well was perforated as shown after drillstem tests in several different intervals in the Morrow. The initial potential, I believe, was some 16 million cubic feet per day interval flow. It was plugged and abandoned in September of 1967 with a cumulative production of approximately half a billion cubic feet of gas and about 2,000 barrels of condensate.

The next well, Pan American's Emperor Federal Well Number 1, was completed in 1965. The perforations are shown, the lower four sets of perforations are roughly correlative to the same lenses or a part of the same lenses that were completed in the Dooley Federal Well. The upper set of perforations, this lens, Morrow Zone was not developed in the Dooley Federal Well. I might point out here on the drillstem test when we took the upper drillstem test shown as drillstem test number five on the Morrow interval that we obtained a stabilized rate of some three million cubic feet of gas per day with a surface pressure of 1,450 pounds. The drillstem test over the lower interval flow at the end of a two-hour test period was 222,000 cubic feet per day with only a 25-pound surface flow pressure. I might say here that this 392 is the minimum that was recorded; it started out in excess of 800 MCF a day or approximately 800 MCF per day and declined steadily. It was still declining at the time the two was shut in. Based on this, we feel that the majority of the gas is coming from this ten foot upper interval. When we completed the well, naturally, by the way, our experience has told us in the past that stimulation is of very little benefit normally in the Morrow gas formations.

When we completed the well, the bottom sets of perforations

were shot and then they had to come out with the perforating gun to reload it and go back in and finish the perforating job. During the two hour shut-in period after perforating the lower set of perforations, surface only built up to some 200 pounds per square inch. Going back in and perforating the upper ten feet the surface pressure on the tubing increased to 4,000 pounds in thirty minutes, here again indicating that the upper zone is contributing the most production.

Going across to Big Eddy Well Number 3 on the righthand side of the cross section, you will notice that it was perforated in the Morrow, and the completion interval or data at the bottom of the log shows that it flowed only 100,000 cubic feet per day through a two-inch open line with basically no surface pressure. This interval correlates roughly to the top interval in drillstem test Number Five, showing that on drillstem test Number Five in our Emperor Federal Well we got a rate of some three million cubic feet per day, that it all was coming from this lower ten foot interval that we later perforated and completed the well.

I might say that we do believe that there may be a slight amount of gas coming from these lower perforations, but it would be only very slight. Actually, Exhibit Number 3 will give us a little bit better indication. We have 43 feet of gross perforated interval. We estimate a net effective pay of

some fourteen feet. The way we got this fourteen feet, we assigned based on drillstem test deliverabilities that 80 per cent of the gas came from this upper perforated interval, twenty per cent came from the lower sets of perforations. Going on through our reservoir on Exhibit Number 3, the average porosity is some 7.3 per cent by log analysis; estimated water saturation from log analysis, 25 per cent. I don't think there is a need to read all of this, but our recoverable gas by core volume analysis using these net pay, porosity, and water saturation numbers at the top of the page is 550,000 cubic feet of gas per acre foot of formation. Chronologically bottom hole pressures are listed on this page; the cumulative produced gas liquid hydrocarbon ratio has been 130.3 thousand cubic feet of gas per barrel of condensate produced.

Q What does Exhibit 4 reflect, please, sir?

A Exhibit 4, sir, is a plot of bottom hole pressure over compressability factor versus cumulative recovery in billions of cubic feet of gas. Cumulative recovery does include the gas equivalent of a condensate. Based on the bottom hole pressures on the previous page and the corresponding compressability factors for the gas, we estimate an ultimate recovery down to 1,000 pounds bottom hold pressure abandonment

pressure of nine and a half billion cubic feet of gas. I might point out here that this last pressure has increased our estimate of the gas that we will recover from this well. It is performing better than we had previously thought that it would.

Q Please go now to Exhibit Number 5.

A All right, sir. Exhibit Number 5 shows the actual measured bottom hole pressure again as was tabulated on Exhibit 3, and the predicted bottom hole pressure, based on the assumption shown on this exhibit, which are 640-acre drainage area, 14 feet of net pay, no water influx to maintain the pressure. We do not think there is any water influx in this area; we have no indication of a gas-water contact. You will see that the actual bottom hole pressure is somewhat greater than what we would anticipate if we were only draining 640 acres. In October of 1957 when we last measured the pressure the bottom hole pressure was some 737 pounds in excess of what we would anticipate.

Q Your assumptions there include 640-acre drainage area, what is the significance then of the difference between what you predicted or expected on that 640-acre assumption and what you have actually found by bottom hole pressure tests?

A In essence, sir, it tells us that we can not only drain 640 acres, but we can drain in excess of 640 acres with

one well.

Q Now, Exhibit Number 6, please, sir.

A All right. Exhibit Number 6 is the drainage area and economic calculations for the Dos Hermanos-Morrow Gas Pool. Drainage area calculations going through them quickly, the reserves from Exhibit Number 4 are 9.5 billion cubic feet. The gas recovery per acre foot is 550,000 cubic feet. This is core volume analysis as pointed out on Exhibit Number 3. The drainage area then using the 9.5 billion cubic feet anticipated recovery, the 550,000 cubic feet per acre foot core volume recovery and fourteen feet of net pay, gives us a drainage area of 1,234 acres. Simply ratioing this down we would anticipate recovering 4.9 billion cubic feet from 640 acres or 2.5 billion cubic feet from 320 acres.

If you would, please, sir, refer to our Exhibit Number 7, while I read off our economic calculations.

Q From Exhibit 6?

A Yes, sir. Our return on investment for 640-acre well with 4.9 billion cubic feet of reserves would be 2.00, which is marginally profitable. Our return on investment with 320-acre well with 2.5 billion cubic feet of reserves is 0.53, which is not economic. The payout for this well is anticipated at 35 months at one and a half million cubic

feet of gas per day which is roughly what the average delivery has been through the life of the well. This return on investment chart shows, or Exhibit Number 7, the return on investment chart, shows the basis for this return on investment, which include a $250,000 well cost and $20,000 lease equipment, $10,000 workover cost sometime during the life of the well, $125.00 per well per month operating cost, twenty cents per MCF of gas, eight barrels of condensate per million cubic feet of gas, $2.81 per barrel condensate and 6.3 per cent direct taxes.

Q Is the $20,000 figure for lease equipment higher or lower than average?

A It's a little bit higher, sir.

Q What is the reason for that?

A We are selling this gas to Potash Company of America. You have the normal lease equipment cost of tanks and high pressure separators and so on and so forth. Also since we are selling this gas to Potash Company of America, we have to build our own gathering system. We would have to lay with 640-acre spacing, drilling an additional well, we would have to lay some one mile of high-pressure pipe to tie it into the system. The actual lease equipment cost, the average has been somewhat higher than that because we have already put in a major portion of the gathering system and also had to put

in a small dehydration plant.

Q Does that complete a discussion of the Exhibit 6 and 7 as they tie together?

A Yes, sir, it does.

Q What is Exhibit Number 8?

A Exhibit Number 8 is simply a tabulation of the production data for Pan American's Emperor Oil Company Federal Gas Communitized Well Number 1 through the history of it being on production, I think it's self-explanatory.

Q And Exhibit Number 9?

A Exhibit Number 9 is a tabulation of the pertinent completion data for the same well, here again, I think this is probably self-explanatory. Most of this information appears on other exhibits.

Q Were these exhibits either prepared by you or under your direction and supervision?

A Yes, sir, they were.

MR. MALONE: We would like to move the admission of Exhibits 1 through 9 into evidence.

MR. UTZ: Without objection, Exhibits 1 through 9 will be entered into the record of this case,

(Whereupon, Applicant's Exhibits 1 through 9 were offered and admitted into evidence.)

Q (By Mr. Malone) Mr. Newman, in your opinion, would the making permanent of the temporary rule including the 640-acre spacing provision tend to prevent economic waste in the further administration of production in this pool?

A Yes, sir, I believe it would.

Q Has any other well been staked within a mile of the Pan American Emperor since the completion of that well in December of 1965 and drilled to the Dos Hermanos Morrow pay?

A No.

Q Do you have a request or a recommendation to the Commission for Pan American?

A Yes, sir. Pan American wishes to recommend and request that the Commission make the current temporary field rules for the Dos Hermanos Gas Field which include 640-acre spacing in limited well locations, permanent rules.

MR. MALONE: That completes our Direct Examination.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Newman, does Pan American have any plans for any other future wells in this area?

A No, sir, not at this time.

Q Is this a unitized area?

A The 640 acres that the well is located on is communitized acreage. It is not within a drilling unit as such.

Q As I interpret this Exhibit 1 correctly, that it is an offset to the Big Eddy Unit?

A Yes, sir, that is correct.

Q But outside the unit?

A Yes, sir.

Q Then the only purpose that 640 acres would serve is that everyone in Section 28 would get a share of the production, is that about the way it is?

A Well, sir, everyone would, of course, get a share of the production.

Q Under the terms of your agreement?

A Right, that's right, but also, I don't really know what the status would be of possible additional development demands from the United States since it is Federal acreage, but 640 acres, I think, will prevent the possibility, if nothing else, of having to drill unnecessary wells to recover the reserves from this Morrow Field.

MR. MALONE: Could I interject one question then?

MR. UTZ: Sure.

Q (By Mr. Malone) It is true, is it not, Mr. Newman,

that Mr. John Anderson for the USGS has previously appeared in this case and suggested to the Commission the approval of the USGS of 640-acre spacing here?

A Yes, that is correct. He appeared at the original hearing for temporary field rules.

Q (By Mr. Utz) This well is approximately 12,000 feet deep?

A Yes, sir, the top of the pay is 12,242 feet. The well was actually drilled to around 13,600 feet to test the Devonian which was found to be water-bearing.

REDIRECT EXAMINATION

BY MR. MALONE:

Q One other question, Mr. Newman, which you may have touched on, but perhaps not made clear, on the basis of 640-acre proration unit, Pan American feels that it will recover a minimum economic return, is that not correct?

A That is true, sir.

Q What is the belief of Pan American in its own operations as to the minimum fair return on investment?

A The bare minimum, I might say, that we are using now is a 1.0 return on investment, however, with the three-year payout anticipated for this well, I don't really know what return on investment management would have to see for

additional drilling, but 1.0 is certainly a very minimum and 320-acre reserves would only give approximately zero point five return on investment.

Q Or a half or what Pan American feels is a minimum return is that on 320?

A Yes, sir, that's correct.

RECROSS EXAMINATION

BY MR. UTZ:

Q Mr. Newman, since this is a one-well pool, you don't have much competition in the matter of drainage, do you?

A That's true, sir.

Q There are no allowables set?

A That is true.

Q Sell all the gas you make regardless of what the spacing is?

A Yes, sir, but there is the possibility, of course, of additional development and additional development demands by the Federal Government. I might point out that this is a potash area and it's not far from active mining. I don't really know what or how hard it would be to get a drilling permit. I understand that it is pretty close to active mining and that some people in our company have looked into the possibility of drilling in this area in the not too distant

past and found that it might be quite hard to get a drilling permit.

Q In line with that statement do you happen to know whether Odessa Natural Dooley Well over there was one of the wells that was near potash area?

A Yes, sir, you will see the potash area, I believe, outlined.

Q That was on 640-acre spacing before they drilled, was it not?

A I do not know, sir.

Q I know one Odessa well did, but I am not sure whether that was it or not.

REDIRECT EXAMINATION

BY MR. MALONE:

Q One other question just to fill out the record and get all the facts in, what is the well making per day?

A The average throughout the life has been about a million and a half cubic feet per day. During November, the last month, it only made, or production was only slightly over a thousand or -- yes, 1,000 MCF per day or a million cubic feet per day.

Q And all the gas today is being sold to Potash Company of America?

A Yes, sir.

Q How is that transported?

A It's transported by our own gathering system.

Q This isn't one of the wells in the Llano System?

A No, sir, we combine the gas from this well with gas from our Big Eddy Strawn Field wells and I think also a little bit of tail gas from our Empire Abo gasoline plant, in our own gathering system.

MR. UTZ: Are there other questions of the witness? You may be excused.

(Witness excused.)

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

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, KAY EMBREE, 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 21st day of Feb, 1968.

Kay Embree
NOTARY PUBLIC

My Commission Expires:

November 19, 1971

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3351, heard by me on [illegible] 1968.

[signature], Examiner
New Mexico Oil Conservation Commission

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
December 14, 1965

EXAMINER HEARING

IN THE MATTER OF:

Application of Pan American Petroleum Corporation for special pool rules for the Dos Hermanos Morrow Gas Pool, Eddy, County, New Mexico. Applicant, in the above-styled cause, seeks the promulgation of temporary special pool rules for the Dos Hermanos Morrow Gas Pool in Section 28, Township 20 South, Range 30 East, Eddy County, New New Mexico, including a provision for 640-acre proration units and fixed well locations.

Case No. 3351

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

MR. UTZ: Case Number 3351.

MR. MALONE: Charles F. Malone of Atwood and Malone for the Applicant. We have one witness and three exhibits.

MR. UTZ: Are there any other appearances? There are none.

(Witness sworn.)

(Whereupon, Applicant's Exhibits 1, 2 and 3 marked for identification.)

W I L L I A M C. C O W A N, a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. MALONE:

Q Would you state your name and address, please, sir?

A William C. Cowan. I am with Pan American Petroleum Corporation in Lubbock, Texas.

Q And your position with the company?

A Petroleum Engineer.

Q How long?

A I've been employed by Pan American for 12 years.

Q Does the jurisdiction of the Lubbock office of Pan American include the land under examination in this application?

A Yes, sir, it does.

Q Are you personally familiar with the application and what it seeks?

A Yes, sir.

Q Mr. Cowan, have you previously testified before this Commission and had your qualifications accepted in matters of petroleum engineering?

A Yes, sir.

MR. MALONE: Mr. Examiner, will the qualifications be acceptable?

MR. UTZ: He's qualified.

Q (By Mr. Malone) Would you state in one or two sentences the purpose of this application?

A Pan American seeks temporary pool rules for the Dos Hermanos Gas Pool which now has one producing well.

Q Referring now to what has been marked Exhibit 1 and which is a brown folder, would you describe the attachment number 1 which appears to be a map of the area?

A Attachment 1 is a contoured structure map based on the top of the Barnett Shale which is also the base of the Morrow which is the producing zone in the Emperor Federal Well Number 1 which is designated by the red arrow on the map.

Q Is the red-arrowed well the single well in this pool which you mentioned?

A Yes, sir, it is.

Q And what other wells are shown?

A There are two other wells in the area that have

penetrated the Morrow zone. The one on the left is Odessa Natural's Dooley Federal Well Number 1 which is some 3-1/2 miles to the west of the Emperor Federal Number 1, and the other well in the area is Pan American's Big Eddy Unit Number 3 located some five miles to the northeast of the Emperor Federal Well Number 1.

Q These three wells that you have described are the three wells connected by the dotted line marked "A" - "A" prime, is that correct?

A Yes, sir, that is correct. That line is a cross section which will be presented in a later attachment.

Q What would you have for the Examiner with respect to the contoured lines which are shown and their validity or their supposed validity?

A Because the data in this area is extremely limited, the interpretation of the Morrow structure is highly speculative and for this reason a portion of the lines are showed dotted to the north. Those that are shown as solid lines are believe reasonable interpretation based on present data. However, again, I would emphasize the speculatives because of limited data.

Q Is there anything else with respect to Attachment Number 1?

A I believe not.

Q Going on to Attachment Number 2 which is the next page, would you describe that, please, sir?

A It is pertinent data in regards to the Pan American Emperor Oil Company Federal Well Number 1. Included is the total depth of the well which is shown as 13,605 feet. Also, I would point out the Morrow perforations which exists in the well from 12,242 feet to 12,391 feet. There are five different intervals that are perforated between those limits.

It is noted that the Emperor Number 1 was potentialled in May of 1965 for a calculated absolute open flow of 13,600 MCF per day. This is based on a four-point back pressure test and the well was actually connected for gas sales in June of 1965.

Q Would you go then to the next Attachment which is Number 3, please, sir?

A Attachment 3 is the previously mentioned cross section.

Q What does this attachment reflect, please, sir?

A This attachment shows the relative structural position of the reservoirs in this area. As noted, we have the Strawn, the Atoka, the Morrow and the Barnett Shale shown on the attachment.

There are three wells included in the cross section. At the bottom of each well is pertinent data that was obtained either from drill stem tests or completion tests from the three

wells shown.

It's noted in Pan American's Emperor Oil Federal Well Number 1 that the five previously mentioned perforated intervals are so designated. From these five intervals an estimated possible net pay porosity of 4 per cent of some 40 feet. Now when this well was perforated, it was differentially. That is to say the pressure inside the casing was lower than the formation pressure. When the lower four intervals were perforated, there was no evidenced tubing pressure at the surface but when the upper interval was perforated, there was an immediate 4,000 psi pressure increase recorded at the surface.

Q What does this cause you to conclude with respect to the productivity of the five or the four sets of perforations?

A Based on the limited data that is available, we feel that the majority of the production is being obtained from the upper interval. For this reason we have assumed that 80 per cent of the production is coming from that interval and the remaining 20 per cent of production is coming from the lower four intervals. As noted, these two intervals were subjected to DST's and the lower interval did record some production. The bottom hole pressures recorded for both zones are comparable and this seems to substantiate the fact the upper interval which flowed at a much higher rate on the DST than the lower interval

is also producing the majority of the gas from the well.

Q Is there anything else of importance with this attachment?

A Well, note also the depth here which is in excess of 12,000 feet. As we'll discuss later, the cause of the depth and the data which is now available we will show a comparison of 320-acre development versus 640-acre development.

Q Now, with respect to the next attachment which is number 4, would you explain that briefly?

A Attachment 4 is your reservoir and production data in regards to the Emperor Oil Federal Well Number 1. Again it is noted that we have estimated some 40 feet of net pay but at the same time it is estimated an effective net pay of only 14 feet. This is based upon the previous presentation which indicated that the majority of the production is coming out of the upper 10-foot perforated interval. In addition we have calculated recoverable gas which is shown as 523 MCF per acre foot and at the bottom of the attachment is the production data which was available as of November 1st, 1965.

Q I notice that your production from May through October appears to be raising. What is the reason for that?

A The last two months show September and October of 1965 showed increased production based upon Pan American's request to Southern Union that we'd be allowed to produce the

well as at high a rate as possible as we could in order to obtain data which help us evaluate the reservoir and this was done as a convenience to Pan American and since this time the well has been returned to productivity of about 1,000 to 1,500 MCF a day. This was a temporary productivity which was granted to Pan American as a convenience.

Q And now with respect to Attachment Number 5, please, sir?

A Attachment Number 5 is a graph which plots the bottom hole pressure divided by your "Z" factor or compressability factor against accumulative production from the well. This is a common accepted practice in trying to determine the ultimate recovery of the well. As noted, there are two pressure points which we have obtained and they have been plotted and the line extrapolted to show an ultimate recovery from the Emperor Federal Well Number 1 of some 4.5 BCF at an abandonment pressure of 1,000 psi.

Q And now, Attachment Number 6, what does it show, please, sir?

A Attachment Number 6 is the economic comparison that wa was previously mentioned which has been estimated to determine the economics for development on 640 acres of drainage area against 320-acre drainage areas. Near the bottom of the attachment you can see the note that payout period for both

wells is estimated at some 35 months and that return on investment for 320 acres is .4 as compared to 1.8 for 640-acre development. Based on these data, we could not support development on 320 acres economically.

Q Is there anything else with respect to that attachment?

A I believe not. I believe the rest is self-explanatory.

Q Is Attachment Number 7 the proposed temporary rules which Pan American would suggest to the Commission in this matter?

A Yes, sir, they are. Without going into detail for each of the five rules. Rule Number 2 and 3 would indicate that we would request 640-acre proration unit assignment and in Rule Number 3 indicates the areas which we would prefer to have the wells drilled on.

Q There is an alteration in Rule Number 3. Is it correct to state that that should read: "Each well completed or recompleted in the Dos Hermanos Morrow Gas Pool shall be located upon, but no nearer than 330 feet to any governmental quarter section line of, the" described portions of the section?

A Yes, sir, that's correct.

Q Is there 640-acre spacing in any other gas pools in the fairly immediate vicinity of this area?

A Yes, sir. The Los Mora Gas Pool is located some ten to fifteen miles to the east and these rules specify 640-acre proration units.

Q Did you state whether in your opinion a prudent operator would continue to develop this area on a 320-acre proration units?

A I mentioned that we could not support economically development of 320-acre proration units.

Q Now then, how would you describe the amount of information which you presently have on this producing formation or interval? Would you say you have a lot of information or not?

A We have limited information and for this reason we would request temporary rules which would allow is to secure additional information upon which to verify or not verify the 640-acre proration unit assignment.

Q Is the productivity of the well, the depth of the production and the expense of drilling and completion a factor in your request for 640 as compared to 320-acre proration units?

A Definitely. Yes, sir.

Q Would you go now to the letter which was marked Exhibit Number 2 and as a separate sheet?

A Exhibit 2 is letter written to Mr. Porter which indicates that William A. and Edward R. Hudson support Pan

American's request for 640-acre proration units and the fixed well locations in this area.

Q And what is Exhibit Number 3, please, sir?

A Exhibit Number 3 is a copy of the telegram from each of the other working interest owners in this particular well: two of which indicate their support of Pan American's request and the third indicates that they are not in a position to either support or not support Pan American's request since they admittedly have no consultant available for this particular situation.

Q In your experience is this kind of telegram from the Bank unusual?

A I would say it's normal.

Q Now then, does Exhibit Number 1 which is the brown folder prepared either by you or under your direct supervision?

A Yes, sir, it was.

Q Mr. Cowan, in your opinion would the establishment of this pool and the adoption of the proposed temporary rules prevent waste?

A Yes, sir, they would.

Q In your opinion would the correlative rights of owners in the vicinity be protected by these rules?

A They would.

MR. MALONE: We would like to offer into evidence

Exhibits 1, 2 and 3, Mr. Examiner.

MR. UTZ: Without objection, Exhibits 1 through 3 will be on the record in this case.

(Whereupon Applicant's Exhibits 1, 2 and 3 were offered and admitted into evidence.)

Q (By Mr. Malone) Mr. Cowan, have I failed to ask you anything on which you would like to make a comment?

A I would like to mention that the Morrow Gas production in Pan American's opinion is not overly attractive in any case and for this reason we would like to have some time to evaluate the performance of this well to determine the drainage area that could reasonably be assigned which would influence additional development or not additional development.

MR. MALONE: That concludes our direct examination.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Cowan, what is the distance between the upper perforations and the lower set of perforations in this well?

A It's on Attachment 2, Mr. Examiner. We have actually indicated that the five intervals. We show the upper interval and the lower portion of it is 12,252 and the next interval is 12,340. That is a difference there of 80 feet.

Q And both of those sets of perforations are in the Morrow zone?

A Yes, sir, that is correct. All of the perforated intervals are in the Morrow zone.

Q In spite of the fact that one zone appears to have higher pressure than the other zones, you believe them to both in the same common source of supply?

A Yes, sir, this is our opinion.

Q At this time do you have any intentions or any plans for drilling another well?

A At this time we do not, Mr. Examiner. Of course, Pan American could enter into other contracts and things of this nature but so far as I know we have no plans for additional development at this time.

Q I notice that your spacing request calls for, speaking roughly, 660-foot square target areas in the center quarter, quarter sections. We have some rules now that require that on 640-acre spacing that require you to be 1650 from the section line. Do you think that 1650 would be satisfactory with you or do you think it's necessary to keep the 330 feet from the quarter, quarter section lines.

A Isn't that the same, Mr. Examiner?

MR. MALONE: I think that it figures out the same.

MR. PORTER: I believe the way the other rules generally read, Mr. Examiner, that the well is to be located not closer than 1650 feet from the section line nor closer

than 330 feet to the boundary of any quarter, quarter section.

MR. UTZ: If that's what they say, that's the same.

MR. PORTER: I believe that's right.

MR. UTZ: So, the only necessity would be to standardize the manner in which to make the pool?

MR. PORTER: Standardization, I think.

MR. UTZ: Are there any other questions of the witness?

MR. PORTER: Just one.

BY MR. PORTER:

Q Did you have additional tests? Did you testify as to what the well produced, the potentials, here?

A Yes, sir. I believe it's recorded on Attachment 2 in about the center of the page where the potential is recorded as 13,600 MCF a day.

MR. PORTER: I see. That's all I have.

MR. UTZ: Any other questions?

The witness may be excused.

(Witness excused.)

Any other statements in this case?

MR. ANDERSON: I would like to make a brief statement, Mr. Examiner.

MR. UTZ: Would you state your name, please?

MR. ANDERSON: John Anderson, Regional Oil and Gas

Supervisor, U. S. Geological Survey. I believe that the Survey would support 640-acre spacing for the Morrow in this area and I think that we all should consider that from the location of the Emperor Well there are open mine workings or commercial ore bodies of potash ore within about a mile to the northwest, within about a mile and a half to the northeast and to the east. Of course, as to the possible extent of the field, I believe the witness has testified as to that and it will take additional drilling to determine it. Of course, one thing we may be faced with down the line if this proves to be an area of more than one or two sections or three section in extent that it may be necessary to immunitize the field to protect the owners of the working interest underlying these potash deposits from drainage. But in any event, the Survey is in favor of 640-acre spacing as a temporary spacing rule for whatever period of time it takes to determine whether this is the proper spacing for the field or not.

MR. UTZ: Thank you. Are there any other statements?

MR. PORTER: Just one other question, here, of the witness. Mr. Cowan, has this pool already been created by the Commission?

THE WITNESS: This is a designated Pool, yes, sir.

MR. PORTER: And what is the extent of the Pool at the present time?

THE WITNESS: So far as I know it's 320 acres.

MR. PORTER: Did you say "320 acres"?

THE WITNESS: Yes, sir.

MR. PORTER: And what are you asking for as to the extent of the pool now?

THE WITNESS: 640 acres, now.

MR. PORTER: In other words you are just asking for the section in which the well is located?

THE WITNESS: Pan American would have no specific limits as to the horizontal nature boundary of the pool but we would like this complete 640-acre spacing included in the pool.

MR. PORTER: Included in the pool?

THE WITNESS: Yes, sir, that's correct.

MR. PORTER: Thank you.

MR. UTZ: Any other statements? The case will be taken under advisement. The Hearing is adjourned until 1:30.

(Whereupon, Case Number 3351 was concluded.)

I N D E X

E X H I B I T S

Exhibit	Marked for Identification	Offered	Admitted
App's. 1	2	12	12
App's. 2	2	12	12
App's. 3	2	12	12

I N D E X

E X H I B I T S

Exhibit	Marked for Identification	Offered	Admitted
App's. 1	2	12	12
App's. 2	2	12	12
App's. 3	2	12	12

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, DEAN A. ROBINSON, 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 3rd day of January, 1966.

Dean A. Robinson
NOTARY PUBLIC

My Commission Expires:

October 16, 1969.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3351, heard by me on 1-7, 1966.

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

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
December 7, 1966

IN THE MATTER OF:

In the matter of Case No. 3351 being reopened pursuant to the provisions of Order No. R-3022, which order established 640-acre spacing units for the Dos Hermanos-Morrow Gas Pool, Eddy County, New Mexico, for a perido of one year. All interested parties may appear and show cause why said pool should not be developed on 320-acre spacing units.

Case No. 3351

BEFORE:

Elvis A. Utz, Examiner

Transcript of Hearing

MR. UTZ: The next case on the docket is Case 3351.

MR. HATCH: Case 3351: In the matter of Case No. 3351 being reopened pursuant to the provisions of Order No. R-3022, which order established 640-acre spacing units for the Dos Hermanos-Morrow Gas Pool, Eddy County, New Mexico, for a period of one year. All interested parties may appear and show cause why said pool should not be developed on 32-acre spacing units.

MR. COOTER: Paul Cooter, of Atwood & Malone, Roswell, appearing for Pan American Petroleum Corporation.

MR. UTZ: Are there other appearances?

MR. KELLAHIN: Jason Kellahin, Kellahin & Fox, Santa Fe, appearing for William A. and Edward R. Hudson.

MR. UTZ: Other appearances? You may proceed.

MR. COOTER: Pan American calls as its witness Carl Harpke.

MR. UTZ: Will the witness stand and be sworn, please?

(Witness sworn)

CARL F. HARPKE, called as a witness, having been first duly sworn on oath, was examined and testified as follows:

MR. COOTER: May I state for the record before commencing the questioning of the witness that Pan American

Petroleum Corporation filed its application approximately a year ago for the establishment of these special rules and regulations and that it is now Pan American's position that the temporary field rules be continued for an additional period of one year. Addressing my questions now to the witness:

EXAMINATION

BY MR. COOTER:

Q Would you state your name for the record?

A Carl F. Harpke.

Q By whom are you employed?

A Pan American Petroleum Corporation of Fort Worth, Texas.

Q What capacity?

A As petroleum engineer.

Q Mr. Harpke, have you previously testified before the New Mexico Oil Conservation Commission?

A Yes, sir, I have.

Q During your previous testimony, were your qualifications made a matter of record?

A They were.

MR. COOTER: Are they acceptable?

MR. UTZ: Yes, sir.

Q Would you very briefly state Pan American's

position at this time and summarize again very briefly the temporary field rules that have been in existence for the past year?

A I believe that the data that we will present here will show rather conclusively that the one well in the Dos Hermanos-Morrow Gas Pool is capable of draining an area in excess of 640 acres. However, because of the fact that we have just one well in the pool and that the possibility exists that there may be some additional development in the near future from which we can get interference data, we are recommending that the present temporary rules be continued on a temporary basis for one year. The temporary rules were set up under Order No. R-3022 dated January 1, 1966.

To avoid burdening the record, I won't go into these records, other than discussing Rule 2 and Rule 4 which I think contain the meat of it. Rule 2 sets up 640-acre proration units for the pool and Rule 4 specifies that each well shall be located no nearer than 1,650 feet to the outer boundary of the section and no nearer than three hundred fifty feet to any governmental quarter section line. This pool is not reporting at this time, therefore, we have no allocation formula.

MR. COOTER: May I state for the Examiner at this time that all of the exhibits that will be offered at this

hearing have been numbered and after the number appears the letter R for the reopened case.

(Whereupon, Applicant's Exhibit 1-R marked for identification.)

Q I will direct your attention first to Exhibit 1-R and ask you to relate what that shows.

A Exhibit 1-R is a structural contour map of the area surrounding Pan American's U. S. Emporer Federal Well Number 1. This is the sole well in the Dos Hermanos-Morrow Gas Pool. I have this well designated here by means of the yellow dot. This well is located in the southeast quarter of the northwest quarter of Section 28, Township 20 South, Range 30 East. I also have two other wells shown on this exhibit. These are two other wells which penetrated the Morrow formation.

To the upper right is Pan American's big Eddy Number Three. This is a former West Lusk Strawn producing well. This well was never completed in the Morrow. The drill stem test on the Morrow formation was rather discouraging. It only showed 100 MCF a day. The other well located, Odessa Dewey Federal Number 1, this well is located in the Eddy-Morrow Gas Pool.

I have this map contoured on the top of the Barnett Shale. This could also be described as being

contoured on the base of the Morrow since the Morrow formation has been deposited directly on top of the Barnett Shale.

The reason for contouring the Barnett Shale is that the Morrow is a rather obscure correlation in this area. Really, it's rather an ambiguous pick. We feel that we can see more correlation to the Barnett Shale. Also structure in this area is rather meaningless in that we don't have a water contact established. Therefore, we can't use structure to define the limits of the Dos Hermanos-Morrow Reservoir. The important thing that the structure map here would reflect is the method in which the Barnett structure controlled the deposition of the Morrow sand during Morrow times. These Morrow sands were deposited to the basinward side of these pre-existing Barnett shale. This map is interpretative. We have only three structural points here.

Q This is the same map or same exhibit that was offered at the prior hearing approximately a year ago but has been updated on ownership?

A Yes, sir, it has been updated as to ownership and also there has been a very slight revision in the map over on the west side in delineating the potash boundary.

Q No other wells have been drilled during this past

year?

A No, sir, not within the limits of this map. Also on this map I have shown by means of a red line the surface trace of a cross section which we will later discuss as Exhibit 3-R.

(Whereupon, Applicant's Exhibit 2-R marked for identification.)

Q Next, directing your attention to Exhibit 2-R, which is similar to Exhibit 2 offered at the prior hearing, what changes have been made in this data sheet on Exhibit 2-R.

A The changes that have been made here are that at the time of the hearing a year ago we had a gas contract only with Southern Union. We have recently finalized a gas contract with Potash Company of America. We are currently delivering gas to both Potash Company of America and on occasion to Southern Union. We have two contracts in effect. Also the liquid hydrocarbon gravity I have shown here, this is currently running about 51 degrees API and at the time of the hearing last year it was 57 degrees. These are the two charges.

(Whereupon, Applicant's Exhibit 3-R marked for identification.)

Q Let's pass on to Exhibit 3-R, which is the cross section. This is the cross section from the three wells

wells that were shown on Exhibit 1, is that correct?

A That's correct. This shows the surface trace of this process on Exhibit 1.

Q This is Odessa National Dewey Well in Section 24 and Pan American Big Eddy Well in Section 6. Then the Emporer Number 1, which is it?

A The middle well is the Emporer Number 1, yes, sir.

Q Would you relate what you show by this?

A On this exhibit I have shown by means of the red correlative marker the top of the Barnett Shale. That was the structural point upon which the Exhibit 1-R was mapped. We have also shown the approximate tops of the Morrow Atoka and the Strawn Formation. Also, for each one of these wells, I have shown pertinent completion data, a drillstem test, data for the Morrow, and also for the Strawn Formation, also, some pertinent production data for each well.

Q Now, then, on the Emporer Number 1 Well, from the drillstem test, the data shown at the bottom below the log on that, have you been able to determine the thickness of the pay zones?

A Yes, sir, I have. Perhaps I should go into some detail in my method at arriving at what I considered an effective pay that is being drained by this well. I have shown here the drillstem tests which were taken in the

Morrow Formation. This is drillstem test Number 5 and drillstem test Number 6. I have also shown the perforated intervals. You will see here there is one upper set of perforations from 12,242 to fifty-two. This is in an area that was covered by drillstem test Number 5. There are four sets of perforations between 12, 340 and 12,391, all of which were covered by drillstem test Number 6. I believe that the drillstem test results and also the completion results show that this lower set of perforations, these lower sets of perforations were contributing very little to the productivity of the well. I believe virtually all of our production is coming out of this upper ten foot set of the perforation is going in.

Further, here this upper drillstem test that I have shown here as drillstem test 5, we had stabilized flow of 3,000 MCF a day, at a flowing tubing pressure of 1,450 pounds. When we took drillstem test Number 6 we had a flowing pressure of three hundred ninety-two MCF a day with a tubing pressure of only 25 pounds. This indicates that this lower zone is virtually nonproductive.

Now, in estimating my pay here we have a total of 40 feet perforated in the well, we have ten feet on the upper zone and we have 30 feet in the lower zone. As I previously said, I feel that this upper ten feet is probably

contributing to the performance of the well, but to give some credit to the lower zone.

We did get a little recovery on drillstem test, I assume that 80 percent of our production is coming from this upper zone and 20 percent is coming from the lower four sets of perforations. This would result in an effective pay estimate of 14 feet for this well. I feel that this is probably an optimistic pay estimate. I think it's probably closer to ten feet, based on performance.

(Whereupon, Applicant's Exhibit 4-R marked for identification)

Q Next, I direct your attention to Exhibit 4-R, reservoir and production data sheet and ask you to relate how this sheet differs from the same numbered exhibit at the previous hearing.

A This is essentially the same data that was presented at the previous hearing. I have changed the recoverable gas estimate from 523 MCF per acre foot that was presented at the last hearing to 509 MCF per acre foot. This is very insignificant in the data. Also I have updated the production tabulation that I have shown on the bottom of the exhibit showing production through October of 1966.

Q Mr. Harpke, what factors should properly be considered in determining the optimum size proration units?

A Well, in determining these optimum size proration units, I think there are two factors that should be considered. First of all, the economics regarding the development on a given proration unit size and secondly, the physical capabilities of a well to effectively drain a given proration unit size.

Q All right, in considering the first factor, the economics, I am going to skip over Exhibit 5 right now and go to Exhibit 6 and ask you to explain the economic information presented by Exhibit 6-R.

(Whereupon, Applicant's Exhibit 6-R marked for identification)

A Exhibit 6-R sets forth development drilling economics for both 320-acre spacing and 640-acre spacing. I have determined the reserves upon which these economics are based. Based upon the 14 feet of net pay that I have previously discussed and my estimate of 519 MCF per acre foot gas recovery to an abandonment pressure of 1,000 pounds, the condensate production is estimated to the present to be 112 MCF per barrel.

I have shown here the value of the gas as 18.4 per MCF, the condensate 289 per barrel. I have shown here gross working interest income. This is subject to twelve and a half per cent royalty, plus 5 percent recovery riding

royalty. I have shown the investment here, well investment of $230,000, less equipment, $10,000, a total development cost of $240,000. I have shown operating expenses based upon the data I have set forth down here at the bottom, taxes 6.3 percent, operating cost of $157.00 per month, condensate trucking charge of 18 cents per barrel, work over cost of $13,000 for the remaining life of the well. This economic data that I have developed here shows that at a gross producing rate of 2,000 MCF per day and condensate rate per day, these wells would pay out in approximately 25 months.

Now, the return on investment that I have developed here for 320-acre spacing is 0.48. This is definitely uneconomic to develop. The 640-acre return on investment would be 1.97. This is economic.

(Whereupon, Applicant's Exhibit 5-R marked for identification.)

Q Passing on to the second factor which you mentioned, the drainage area, I direct your attention to Exhibit 5-R and ask you to explain that to the Examiner.

A Well, as I previously stated, we have just one well in the Dos Hermanos-Morrow Pool. Now, it's possible to determine drainage area for the performance of one well by two different methods. I have employed both of these methods on here, the first is on Exhibit 5-R and the second method

I will discuss in conjunction with Exhibit 7. Both of these methods use essentially the same data reserves production and actual pressure measurements, made over a certain span of accumulative production from the well.

In regard to Exhibit 5-R, this is a plat of bottomhole pressure divided by compressibility factors versus cumulative production. Here the cumulative gas production includes both the free gas produced and the gas equivalent of the stock condensate. I have four pressure points which were plotted here, an original pressure and three points plotted and succeeding pressure measurements, I have the actual pressure data recorded on Exhibit 7. Now, of course, the more depleted that a gas pool becomes, the more accurate is our ability to predict gas reserves. However, the fact that the four pressure points line up in almost a straight line leads me to believe that this is a valid extropulation and that my reserve estimates here are accurate. An extropulation of the bottomhole pressure over C factor versus cumulative production to an abandonment pressure of 1,000 PSI indicates an ultimate gas recovery of 7.35 BCF.

Further extropulation of this indicates an original gas in place of 9.38 BCF. Actually, what this exhibit represents is a graphical picture of the material

balance for a volumetrically controlled gas reservoir.

Now, I have taken this 7.35 BCF ultimate gas recovery and I have converted this to a drainage area. I have shown my calculations.

In this I have a calculated drainage volume of fourteen thousand four hundred fifty feet. I determined this by dividing the ultimate recovery from the well divided by the ultimate recovery per acre foot of 509 MCF that we had developed previously. This fourteen thousand four hundred fifty acre feet we applied to the fourteen foot net effective pay estimate would result in an indicated drainage area of 1,031 acres, that is the drainage area that is being influenced by this well.

(Whereupon, Applicant's Exhibit 7-R marked for identification)

Q Next I direct your attention to Exhibit 7-R and ask you to explain that to the Examiner.

A Exhibit 7-R is a plat of actual and theoretical and perhaps I should say predicted bottomhole pressure plotted versus time. The theory behind this is simple. If we assume that the well is draining only 640 acres we can then determine predicted pressure measurements or calculate what the theoretical pressure should be for given increments of cumulative gas production. Now, I have shown the actual

measured bottomhole pressure by means of the red line. This is the upper curve here and it's labeled actual bottomhole pressure. I have shown the original bottomhole pressure here of 51 PSI and I have shown succeeding pressure made in November of 1965, January of '66 and the last one being made on the 18th of July, 1966. Now, I have also shown here in green the theoretical pressure which I would predict, if I assumed that the well was draining only 640 acres as 14 feet of net effective pay and that there was no water influx that would be effecting the pressure performance of the reservoir. Now, in regard to this assumption as to water influx, I don't know of any water drive Morrow Gas Reservoir in Southeast New Mexico, but if we did have an active water drive throughout the reservoir, I think it would just be one more piece of supporting data to show that the well could drain in excess of 640 acres because to have an active water drive to the extent that it would influence the performance of the reservoir, you would have to have very good horizontal and vertical communication, but as I say, I don't believe that this is the case. I don't think we have water influx here. I might point out that the last pressure point, the last actual and last predicted bottomhole pressure point here on July 18, 1966 as pressure of forty-six hundred six PSI was measured,

at that time we had a cumulative gas production of approximately 576 MCF and 5,600 barrels of condensate. My prediction here would be [illegible]440 PSI and 156 PSI less than what was actually measured. This suggests to me the fact that the actual pressure is higher than the predicted pressure, that we are certainly draining more than 640 acres here.

Q Then from these Exhibits 5 and 7 on the area of drainage and Exhibit 6 on the economics, is it your opinion that 320 acre unit would not be economic, that 640 would be, that the one well on the 640-acre unit efficiently and economically drains the full 640-acre unit?

A Yes, sir, that is correct.

Q Pan American is asking that these temporary rules be continued for only another year. Why is Pan American asking that rather than that they be made permanent?

A Well, as I mentioned earlier, we do not have the one well reservoir and we think there may be some additional development in the reservoir, which would give us some post interference data. Actually, I think the data here, that I have presented here, I think the economics would be justified in granting permanent rules on it, but we felt that possibly since we only had the one well that the continuance of temporary rules would be proper.

Q Do you have anything else you want to add?

A No.

MR. COOTER: We offer Exhibits 1-R through 7-R, Mr. Utz.

MR. UTZ: The stated Exhibits will be entered into the record in this case.

(Whereupon, Applicant's Exhibits 1-R through 7-R admitted in evidence.)

MR. UTZ: Questions of the witness? Mr. Harpke, what are Pan American's plans for developing this pool?

A We do not have any additional plans for development, Mr. Utz.

MR. HUDSON: There have been some wells and now there are Strawn Wells being drilled up toward this Morrow Pool which will probably be carried to the Morrow.

MR. UTZ: Without any development, a year from now, you won't have any more information than you have now?

A We will have a little more performance history, maybe something to further validate the Exhibit 5-R and Exhibit 7-R.

MR. UTZ: Other questions? Witness may be excused.

MR. COOTER: Before the witness leaves the stand, we were talking about the possible other wells. While Pan American doesn't have any other plans to drill additional

Q Do you have anything else you want to add?

A No.

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(Whereupon, Applicant's Exhibits 1-R through 7-R admitted in evidence.)

MR. UTZ: Questions of the witness? Mr. Harpke, what are Pan American's plans for developing this pool?

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A We will have a little more performance history, maybe something to further validate the Exhibit 5-R and Exhibit 7-R.

MR. UTZ: Other questions? Witness may be excused.

MR. COOTER: Before the witness leaves the stand, we were talking about the possible other wells. While Pan American doesn't have any other plans to drill additional

wells, there have been some indications that additional wells might possibly be drilled, where is it, in 29?

A Yes, sir, in 29 we had heard that an operator was considering a well there.

MR. COOTER: That was one of the wells to which you referred to possibly from the interference data that if that well is drilled from the interference data, that would be obtained by that?

A Yes, sir, that's correct.

MR. COOTER: I didn't want any misunderstanding.

MR. UTZ: Statements?

MR. KELLAHIN: On behalf of William and Edward R. Hudson, William A. and Edward R. are the owners of one-fourth interest in the subject well and on the basis of the engineering testimony that has been presented here and the economics of the situation in this particular pool, we support the application of Pan American for continuance of the present spacing order for a period of one year.

MR. UTZ: Other statements? Case will be taken under advisement.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, KAY EMBREE, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission Examiner at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

Kay Embree
Court Reporter

I do hereby certify that the foregoing is a complete record of the proceedings in the hearing of Case No. 3351, heard by me on 12-7, 1966.

..., Examiner
New Mexico Oil Conservation Commission

3351
Heard 12-14-65
Rec. 12-16-65

1. Grant Pan Am. 640 acre spacing in special Pool rules for the Dos Hermanos - Morrow Gas Pool. - (temporary) Use either Indian Basin or Grama-Ridge- orders. R-2441 or R-3006 as model order for this pool.

P.S. call up again for Nov. or Dec. 1966.

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

December 23, 1965

Mr. Charles Malone
Atwood & Malone
Attorneys at Law
Post Office Box 700
Roswell, New Mexico

Re: Case No. 3351
Order No. R-3022
Applicant:

Pan American Petroleum 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

ALP/ir

Carbon copy of order also sent to:

Hobbs OCC x
Artesia OCC x
Aztec OCC

Other

DOCKET MAILED
Date 11-23-65

Docket No. 31-66

DOCKET: EXAMINER HEARING - WEDNESDAY - DECEMBER 7, 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 3500: In the matter of the hearing called by the Oil Conservation Commission on its own motion to permit all operators in the Vacuum Field, Lea County, New Mexico, to show cause why the disposal of produced salt water in unlined pits should be permitted in the Vacuum Field.

CASE 3501: In the matter of the hearing called by the Oil Conservation Commission on its own motion to consider amending Commission Order No. R-1670, as amended, which governs all prorated gas pools in San Juan, Rio Arriba, Sandoval, Lea, Eddy, and Roosevelt Counties, New Mexico. The Commission will consider amending said order to provide a system for the approval of a non-standard gas proration unit without a hearing or without notification to offset operators provided said non-standard units result from a deviation in the United States Public Lands Survey and provided the size of the unit is within from 75 percent to 125 percent of a standard unit size in its respective pool.

CASE 3351: (Reopened)
In the matter of Case No. 3351 being reopened pursuant to the provisions of Order No. R-3022, which order established 640-acre spacing units for the Dos Hermanos-Morrow Gas Pool, Eddy County, New Mexico, for a period of one year. All interested parties may appear and show cause why said pool should not be developed on 320-acre spacing units.

CASE 3348: (Reopened)

In the matter of Case No. 3348 being reopened pursuant to the provisions of Order No. R-3019, which order established 80-acre spacing units for the South Prairie-San Andres Pool, Roosevelt County, New Mexico, for a period of one year. All interested parties may appear and show cause why said pool should not be developed on 40-acre spacing units.

317 J. P. White Bldg.

GRANT KEYES
OIL PROPERTIES
P. O. BOX 1997
ROSWELL, NEW MEXICO
88201

PHONE 622-8770

66 NOV 23 AM 10

T 20 S R 30 E Eddy County

OCC Santa Fe Box 2088
Good Morning :-

Case # 3351
Order # R-3020

The Pan American Petroleum Corporation called for 640 acre tractfor wells in the above area.

The case shall be reopened in December 1966 and show cause why the Dos Hermanos-Morrow Gas Pool may appear and show cause why the Dos Hermanos-Morrow Gas Pool should not be developed on 320 tracts

Keyes & Atwood sold the NE $\frac{1}{4}$ and the S$\frac{1}{2}$SW 80 to the Pan Am, they gave us an override of 7$\frac{1}{2}$. We sure want to see the 320 go over.

Yours very truly

Grant Keyes

DOCKET MAILED

Date 11-29-66

ac

OFFICE PHONE 746-3558

HARVEY E. YATES
DRILLING AND PRODUCTION
CARPER BUILDING

ARTESIA, NEW MEXICO - 88210

5 December 1966

'66 DEC 6 AM 8 21

RE: Case No. 3351

Mr. A. L. Porter, Jr.,
Secretary-Director
Oil Conservation Commission of New Mexico
P. O. Box 2088
Santa Fe, New Mexico 87501

Dear Mr. Porter:

As a working interest owner in the Dos Hermanos-Morrow Gas Pool, Eddy County, New Mexico, I request the present temporary 640-acre spacing be continued for one (1) year.

Very truly yours,

Harvey E. Yates

Harvey E. Yates
dp

FRANK STUBBEMAN
HAMILTON E. McRAE
TOM SEALY
BOYD LAUGHLIN
FRED M. CASSIDY
F. H. PANNILL
WM. B. BROWDER, JR.
WALTER C. BEARDSLEY
W. F. PENNEBAKER
DURWARD M. GOOLSBY
RECTOR CANNON
JAMES G. NOLAND
WM. M. COTTON
ROBERT J. COWAN
ROBERT K. HUDSON
MILTON L. BANKSTON
BEN M. BRIGHAM, JR.
HOWARD V. ROSE, JR.
SAM F. HURT, JR.
ROBERT C. ELEDSOE
CHARLES L. TIGHE
RUSH MOODY, JR.
JOHN HARRELL FELDT
GENE L. JAMESON
SMITH RAY

STUBBEMAN, McRAE, SEALY & LAUGHLIN
ATTORNEYS AT LAW
MIDLAND SAVINGS BUILDING
MIDLAND, TEXAS
79701

AREA CODE 915
MUTUAL 2-1616
P. O. BOX 670

66 DEC 9 AM 8:31

December 8, 1966

Received Dec 9th

Mr. A. L. Porter, Jr.
Secretary - Director
New Mexico Oil Conservation Commission
Santa Fe, New Mexico 87501

Dear Mr. Porter:

Our clients, Stoltz & Company, a partnership composed of Deane H. Stoltz, Cyril Wagner, Jr. and Jack E. Brown, Pennzoil Company, a corporation, and Chambers & Kennedy, a partnership composed of C. Fred Chambers and W. D. Kennedy, own working interests both south and west of the Morrow gas well in Section 28, Township 20 South, Range 30 East, N.M.P.M., Eddy County, New Mexico. Reference is made to Case No. 3351 and Order No. R-3022 issued by the Commission in the latter part of 1965 setting up temporary field rules for 640 acre spacing.

It is our understanding that a hearing was held on December 7, 1966 regarding this matter and that Pan American Petroleum Corporation requested the extension of such temporary rules for 640 acre spacing. We regret that our clients were unable to be at this hearing. However, our clients do definitely wish to make it clear that they are opposed to 640 acre spacing in the area for the Morrow gas zone and request that the Morrow gas pool be developed on 320 acre spacing units.

To be more specific as to the interest of our clients, they have leasehold interests in S/2 Section 29, W/2 Section 33, Township 20 South, Range 30 East, N/2 Section 4, N/2 Section 5, N/2 Section 6, Township 21 South, Range 29 East, W/2 Section 31 and W/2 Section 32, Township 20 South, Range 30 East, as well as Section 1, Township 21 South, Range 28 East.

We would appreciate your consideration of this.

Respectfully submitted,

STUBBEMAN, McRAE, SEALY & LAUGHLIN

By
Robert C. Bledsoe

RCB:ms

Case 3351
Heard 12-7-66
Rec. 12-7-66

1. Grant Pan American a 1-year extention of R-3022 640 Ac. Spacing for Rose Kennamer Gas Pool.

Pool has only one well of questionable economic value. Drilling in Area should assist in gathering more data.

Docket No. 4-68

DOCKET: EXAMINER HEARING - WEDNESDAY - FEBRUARY 7, 1968

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 3719: Application of Amerada Petroleum Corporation for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Siluro-Devonian formation in the interval from 11,010 feet to 11,325 feet in its L. H. Chambers Well No. 1 located in Unit F of Section 11, Township 12 South, Range 33 East, Eagley Field, Lea County, New Mexico.

CASE 3720: Application of Sinclair Oil & Gas Company for salt water disposal, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Abo formation in the interval from 6982 to 7092 feet in its Turner "B" Well No. 73, located in Unit C of Section 29, Township 17 South, Range 31 East, Cedar Lake-Abo Pool, Eddy County, New Mexico.

CASE 3348: (Reopened)

In the matter of Case No. 3348 being reopened pursuant to the provisions of Order No. R-3019-A, which order extended 80-acre spacing units for the South Prairie-San Andres Pool, Roosevelt County, New Mexico, for a period of 14 months. All interested parties may appear and show cause why said pool should not be developed on 40-acre spacing units.

CASE 3351: In the matter of Case No. 3351 being reopened pursuant to the provisions of Order No. R-3022-A, which order extended 640-acre spacing units for the Dos Hermanos-Morrow Gas Pool, Lea County, New Mexico, for a period of 14 months. All interested parties may appear and show cause why said pool should not be developed on 320-acre spacing units.

CASE 3520: (Reopened)

In the matter of Case No. 3520 being reopened pursuant to the provisions of Order No. R-3184, which order established 80-acre spacing units for the Northeast Bagley-Wolfcamp Pool, Lea County, New Mexico, for a period of one year. All interested parties may appear and show cause why said pool should not be developed on 40-acre spacing units.

CASE 3721: In the matter of the hearing called by the Oil Conservation Commission on its own motion to permit H. E. Barnes and all other interested parties to appear and show cause why the H. E. Barnes Levers State Well No. 1 and the H. E. Barnes Levers State Well No. 2, located in Units G and H, respectively, of Section 32, Township 7 South, Range 26 East, Pecos-San Andres Pool, Chaves County, New Mexico, should not be ordered plugged and abandoned in accordance with a Commission-approved plugging program.

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

December 9, 1966

Mr. Paul Cooter
Atwood & Malone
Post Office Box 700
Roswell, New Mexico

DOCKET MAILED
Date 1-25-67

Re: Case No. 3351
Order No. R-3022-A
Applicant:
PAN AMERICAN PETROLEUM CORP.

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 x
Aztec OCC _____
OTHER Mr. Jason Kellahin

FORM 470 2-57

PAN AMERICAN PETROLEUM CORPORATION

P. O. Box 268
Lubbock, Texas 79401
November 18, 1965

Case 3357/ 65 NOV

File: RES-3700-986.510.1

Subject: Application of Pan American Petroleum Corporation for Adoption of Temporary Rules Dos Hermanos (Morrow) Gas Pool Eddy County, New Mexico

Mr. A. L. Porter (3)
Secretary-Director
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico

Dear Sir:

Pan American as operator of the subject well respectfully requests that a hearing be docketed to consider its application for adoption of temporary rules for the Dos Hermanos (Morrow) Gas Pool, Eddy County, New Mexico.

In our opinion, the information available to date regarding this Pool indicates the necessity for, and we plan to request, the following temporary rules:

1. 640 acre proration units, being a standard single governmental section.

2. Each well drilled or recompleted in the Dos Hermanos (Morrow) Gas Pool subject to the effective date of the rules shall be located no nearer than 330 feet to any governmental quarter-quarter section line of the SW/4 of the NE/4, the NW/4 of the SE/4, NE/4 of the SW/4 or SE/4 of the NW/4 of a governmental section.

At the present time, the subject Pool contains only one well, Pan American's USA-Emperor Oil Company Well No. 1, and as shown on the attached plat, this well is located 1980 feet from the north and west line, Unit F, Section 28, T-20-S, R-30-E, Eddy County, New Mexico.

In our opinion, the establishment of the above rules on a temporary basis will be in the interest of conservation and protection of correlative rights.

Yours very truly,

Neil S. Whitmore
District Production Superintendent

WCC:jn
cc: All Working Interest Owners
(List attached)

DOCKET MAILED
Date 12-1-65

WORKING INTEREST OWNERS
DOS HERMANOS (MORROW) GAS POOL
EDDY COUNTY, NEW MEXICO

Mr. Harvey Yates
Yates Bldg.
Artesia, New Mexico

Hudson & Hudson
1st National Bank Bldg.
Fort Worth, Texas

1st Hutchings -
Sealy National Bank of Galveston, Trustee
Galveston, Texas

PERTINENT COMPLETION DATA

PAN AMERICAN'S EMPEROR OIL COMPANY FEDERAL WELL NO. 1
DOS HERMANOS-MORROW GAS POOL
EDDY COUNTY, NEW MEXICO

Location	Unit F, 1980' FN & WL, Sec. 28, T-20-S, R-30-E, Eddy County, New Mexico.
Total Depth	13,605'
Plugback Depth	12,825'
Elevation	3359 RDB
Production Casing String	7" set at 13,375'
Morrow Perforations	12,242-52', 12,340-51', 12,362-73', 12,376-81', 12,385-91'
Morrow Stimulation	None
Potential	CAOF (4 Pt.) 13,600 MCFPD, 5-1-65
Connection Date for Gas Sales	6-7-65 (Southern Union)
Present Gas Purchaser	Southern Union & Potash Company of America
Gas Gravity	0.612
Original Gas - Liquid Hydrocarbon Ratio	66.6 MCF/Bbl.
Liquid Hydrocarbon Gravity	51° API @ 60°F.

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
Pan Am EXHIBIT NO. 2-R
CASE NO. 3357

RESERVOIR AND PRODUCTION DATA
PAN AMERICAN'S EMPEROR OIL COMPANY FEDERAL WELL NO. 1
DOS HERMANOS (MORROW) GAS POOL
EDDY COUNTY, NEW MEXICO

RESERVOIR DATA

Net Pay, Feet	40
Est. Effective Net Pay, Feet	14
Average Porosity, %	7.3
Est. Water Saturation, %	25
Producing Mechanism	Pressure Depletion
Lithology	Medium to coarse grain angular quartz sandstone
Gas-Water Contact	Not Defined
Reservoir Temperature, °F	176
Initial Pressure, psi and Datum, Feet	5104 @ -8889
Abandonment Pressure, psi and Datum, Feet	1000 @ -8889
Recoverable Gas, MCF/Ac. Ft.	509

PRODUCTION DATA

Date	Bbls. Condensate	MCF Gas
5-65	391	136
6-65	146	17,580
7-65	94	19,560
8-65	492	36,321
9-65	787	90,264
10-65	753	98,473
11-65	155	33,965
12-65	99	17,765
1-66	90	17,467
2-66	148	9,158
3-66	497	44,843
4-66	441	52,317
5-66	486	54,689
6-66	487	59,907
7-66	430	48,537
8-66	526	57,188
9-66	411	54,160
10-66	327	45,854
Cumulative 11-1-66	6760	758,184

Cumulative Produced Gas-Liquid Hydrocarbon Ratio: 112 MCF/Bbl

Development Drilling Economics
320-Acre and 640-Acre Well Spacing
Dos Hermanos-Morrow Gas Pool
Eddy County, New Mexico

	320 Acres	640 Acres
Reserves		
Gas, MCF	2,280,000	4,560,000
Condensate, Bbls.	20,800	41,600
Value		
Gas, $/MCF	.184	.184
Condensate, $/Bbl	2.89	2.89
Gross Working Interest Income*		
Gas, $	346,000	692,000
Condensate, $	49,500	99,000
Total, $	395,500	791,000
Investment		
Well, $	230,000	230,000
Lease Equipment, $	10,000	10,000
Total, $	240,000	240,000
Operating Expense, $**	41,200	77,400
Profit per Well, $	114,300	473,600
Payout, Months	25	25
Production During Payout		
Gas, MCFD	2,000	2,000
Condensate, BCPD	18	18
Return on Investment	0.48	1.97

*Less 12.5% Royalty plus 5% ORI
**Includes Taxes of 6.3%, Operating expense of $175/month, condensate trucking charge of $0.18 per barrel, and Workover costs of $5,000.

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
6-16
3357

Development Drilling Economics
320-Acre and 640-Acre Well Spacing
Dos Hermanos-Morrow Gas Pool
Eddy County, New Mexico

	320 Acres	640 Acres
Reserves		
Gas, MCF	2,280,000	4,560,000
Condensate, Bbls.	20,800	41,600
Value		
Gas, $/MCF	.184	.184
Condensate, $/Bbl	2.89	2.89
Gross Working Interest Income*		
Gas, $	346,000	692,000
Condensate, $	49,500	99,000
Total, $	395,500	791,000
Investment		
Well, $	230,000	230,000
Lease Equipment, $	10,000	10,000
Total, $	240,000	240,000
Operating Expense**, $	41,200	77,400
Profit per Well, $	114,300	473,600
Payout, Months	25	25
Production During Payout		
Gas, MCFD	2,000	2,000
Condensate, BCPD	18	18
Return on Investment	0.48	1.97

*Less 12.5% Royalty plus 5% ORI
**Includes Taxes of 6.3%, Operating expense of $175/month, condensate trucking charge of $0.18 per barrel, and Workover costs of $5,000.

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DISCUSSION

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Pan American Petroleum Corporation, for itself and the other working interest owners, respectfully requests the New Mexico Oil Conservation Commission to establish Temporary Pool Rules for the Dos Hermanos (Morrow) Gas Pool, Eddy County, New Mexico. This Pool contains only one well, the Pan American operated Emperor Oil Company Federal Well No. 1. Included in our request is a provision for 640-acre proration units and fixed well locations.

Attachment I is a structure map for this immediate area contoured on top of the Barnett Shale, which is located at the base of the Morrow. This map shows the three wells in the area that have penetrated the Morrow, the Emperor Oil Company Federal Well No. 1 and two other wells. Odessa Natural's Dooley Federal Well No. 1, is included in the Getty (Morrow) Gas Pool as the only completion in that Pool. The other well, Pan American's Big Eddy Well No. 3, is now plugged and abandoned after initially testing the Morrow and subsequently being completed in the Lusk, West (Strawn) Oil Pool.

Pertinent data for the Emperor Oil Company Federal Well No. 1 is shown on Attachment II. Investigation of these data indicate the well was initially potentialed for 13,600 MCF per day based on a 4-point Calculated Absolute Open Flow test taken May 1, 1965. This well was connected for gas sales on June 7, 1965.

A cross-section is included as Attachment III which shows the relative structural positions of various intervals in this area. The same three wells which penetrated the Morrow are included on this attachment. The lower four perforated intervals in the Emperor Oil Company Federal Well No. 1 are

apparently correlative with the interval being produced in the Odessa-Dooley Federal Well No. 1. In addition, an Upper Morrow Sand interval is also perforated in the Emperor Oil Company Federal Well No. 1. For information, differentially perforating this upper interval resulted in an increase in tubing pressure of 4,000 psi, as compared to no increase in pressure when the lower intervals were perforated. For this reason, we feel the majority of the gas produced is being recovered from the upper perforated interval. This is further substantiated by the DST's over these two intervals. The well has not been stimulated.

Reservoir and Production Data for this Pool is shown in Attachment IV. Investigation indicates cumulative production from the Emperor Oil Company Federal Well No. 1, as of November 1, 1965, was some 268.8 MMCF of gas and 2800 barrels of condensate.

In order to better evaluate this reservoir, bottom hole pressures were collected in August and November of 1965. These pressures were used along with cumulative gas production to develop Attachment V. Investigation of this graph indicates ultimate recovery from the Emperor Oil Company Federal No. 1 should equal 4.5 BCF of gas, assuming an abandonment pressure of 1,000 psi.

Attachment VI is an Economic Comparison for drilling wells on 320-acre spacing as compared to 640 acre spacing. For information, the drainage area for the Emperor Oil Company Federal Well No. 1 is calculated as 615 acres, using the ultimate recovery figure of 4.5 BCF, and assuming 14' of effective net pay. As noted, some 40' of possible net pay exists in this well; however,

as previously mentioned, the upper 10' interval is believed to be producing the major portion of gas. Assuming the upper 10' are recovering 80 per cent of production and the lower 30' are contributing 20 per cent, allows the 40' of possible net pay to be reduced to 14' of probable effective pay. This basis is believed reasonable based on results obtained. As noted, economics are attractive only when wells are drilled with 640 acre proration units.

Attachment VII lists the Temporary Rules which Pan American would prefer to have established for this Pool. Since performance data is limited, we are requesting temporary rather than permanent rules at this time.

WCC:jn

December 10, 1965

Mr. A. L. Porter
Secretary-Director
New Mexico Oil Conservation Commission
P.O. Box 2088
Santa Fe, New Mexico

File RES-3700-986.510.1

Re: Application of Pan American
Petroleum Corporation for
Adoption of Temporary Rules
Dos Hermanos (Morrow) Gas Pool
Eddy County, New Mexico

Dear Mr. Porter:

We are in receipt of copy of a letter from Pan American Petroleum Corporation to you dated November 18, 1965, in connection with the captioned application.

In our opinion, the information available to date regarding this pool indicates the necessity for, and we concur in Pan American's request, the following temporary rules:

1. 640 acre proration units, being a standard single governmental section.

2. Each well drilled or recompleted in the Dos Hermanos (Morrow) Gas Pool subject to the effective date of the rules shall be located no nearer than 330 feet to any governmental quarter-quarter section line of the SW/4 of the NE/4, the NW/4 of the SE/4, NE/4 of the SW/4 or SE/4 of the NW/4 of a governmental section.

We believe that the establishment of the above rules on a temporary basis will be in the interest of conservation and protection of correlative rights.

Yours very truly,

WILLIAM A. & EDWARD R. HUDSON

By: Edward R. Hudson

ERH/ls

Telefax **WESTERN UNION** Telefax

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PAN AMERICAN PETROLEUM CORP LUBBOCK TEX

RE HEARING THE 640 ACRE PRORATION UNIT HEARING FOR DOS HERMANOS GAS POOL. BECAUSE WE HAVE AT HAND NO DETAILED GEOLOGICAL AND ENGINEERING INFORMATION WE WOULD PREFER TO OFFER NO OPINION NOR SOLICITATIONS CONCERNING THE MATTER AT THIS TIME. FOR FUTURE HEARINGS WE WOULD BE HAPPY TO CONSIDER THE CASE WHEN THE ABOVE INFORMATION IS SUPPLIED US

FIRST HUTCHINGS SEALY NATL BANK GALVESTON TEXAS.

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Telefax **WESTERN UNION** Telefax

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NEIL S WHITMORE DISTRICT PRODUCTION. SUPT

PAN AMERICAN PETROLEUM CORP LUBBOCK TEX

REUR LETTER TO MR PORTER WITH NMOCC DATED 11-18-65 THIS WILL EVIDENCE OUR CONCURRENCE IN PAN AMERICAN'S REQUEST TO NMOCC FOR TEMPORARY RULES FOR THE DOS HERMANOS (MORROW) GAS POOL PROVIDING FOR 640 ACRE PRORATION UNITS AND FIXED WELL LOCATION. WE ARE DIRECTING A LETTER TO THE NMOCC TODAY TO THIS EFFECT

WILLIAM A AND EDWARD R HUDSON, JOINT OPERATORS BY EDWARD R HUDSON

NMOCC 11-18-65.

1270 (1-51)

Telefax **WESTERN UNION** Telefax

O-Res

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DA114

D EPA127 PD ARTESIA NMEX 10 920A MST

ATTN MR NEIL S WHITMORE

PAN AMERICAN PETROLEUM CORP 1628 19 ST LUBBOCK TEX

RE: FILE RES-3700-986.510.1 APPLICATION OF PAN AMERICAN PETROLEUM CORPORATION FOR ADOPTION OF TEMPORARY RULES DOS HERMANOS (MORROW) GAS POOL EDDY COUNTY, NEW MEXICO THIS IS TO ADVICE YOU THAT I, (HARVEY E YATES), A WORKING INTEREST OWNER IN THE PAN AMERICAN USA-EMPEROR OIL COMPANY WELL NO1, AM IN COMPLETE AGREEMENT WITH THE INFORMATION AS SET FORTH IN YOUR APPLICATION TO MR A L PORTER DATED NOVEMBER 18, 1965 REQUESTING TEMPORARY RULES FOR THE SUBJECT GAS POOL. BASED ON MY INFORMATION, IT IS MY OPINION THAT640 ACRE PRORATION UNITS AND FIXED WELL LOCATIONS AS YOU HAVE REQUESTED ARE DEFFINITELY IN THE BEST INTEREST OF CONVERSATION AND PROTECTION OF CORRELATIVE RIGHTS VERY SINCERELY

HARVEY E YATES

1270 (1-51)

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 3
CASE NO. 3351