

DEARNLEY-MEIER REPORTING SERVICE, Inc.

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PHONE 243-6691

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
June 14, 1962

REGULAR HEARING

IN THE MATTER OF:

(Reopened)

Application of the Oil Conservation Commission) CASE 1641
on its own motion to reconsider the special)
rules and regulations for the Angels Peak-)
Gallup Oil Pool, San Juan County, New Mexico.)

Case 1641 will be reopened pursuant to)
Order No. R-1410-C to permit interested par-)
ties to appear and present testimony relative)
to the effectiveness of the special rules and)
regulations for the Angels Peak-Gallup Oil)
Pool.)

BEFORE:

Governor Edwin L. Mechem
Mr. A. L. (Pete) Porter
Mr. E. S. (Johnny) Walker

TRANSCRIPT OF PROCEEDINGS

MR. PORTER: The Commission will take up next Case 1641.

MR. MORRIS: Application of the Oil Conservation
Commission on its own motion to reconsider the special rules and
regulations for the Angels Peak-Gallup Oil Pool, San Juan County,
New Mexico.

MR. WHITWORTH: For the record, Garrett Whitworth and
the Santa Fe firm of Seth, Montgomery, Federici and Andrews for
El Paso Natural Gas Company.

MR. PORTER: I would like to call for other appearances



at this time. Mr. Buell.

MR. BUELL: If it please the Commission, are you interested in all of us interested entering an appearance again?

MR. PORTER: I don't think it would hurt anything to ask for re-appearances. It has been quite some time.

MR. BUELL: For Pan American Petroleum Corporation, Guy Buell.

MR. PORTER: I have forgotten who all was involved. Anyone else desire to make an appearance in the Angels Peak case? Mr. Buell, does Pan American have testimony?

MR. BUELL: Yes, sir, we have one witness.

MR. PORTER: Mr. Whitworth?

MR. WHITWORTH: El Paso has one witness, Mr. Rainey.

MR. PORTER: I will ask you to proceed with your testimony at this time.

(Witness D. H. Rainey sworn.)

D. H. RAINEY

called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. WHITWORTH:

Q Mr. Rainey, would you please state your full name, by whom and in what capacity you are employed?

A David H. Rainey, Administrative Assistant in the Proration Department for El Paso Natural Gas Company.

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Q You have previously testified before this Commission as an expert witness, haven't you, Mr. Rainey?

A Yes, sir, in this case.

MR. PORTER: The witness' qualifications are acceptable.

Q (By Mr. Whitworth) Mr. Rainey, have you had occasion to make a study recently of the production characteristics and gas-oil ratios of the Angels Peak-Gallup Oil Pool?

A Yes, sir. We have reviewed to date, from the time of the last hearing, the production performance history and the gas-oil ratio performance history of this pool and have had exhibits prepared to show the production performance and the gas-oil ratio performance in this pool since the time of the last hearing in July of 1960.

Q Do you also have an exhibit which is a plat showing wells in this pool?

A Yes, sir, I do.

Q Is that El Paso's Exhibit No. 1?

A Yes, sir.

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

Q You mentioned an exhibit showing the production history of the Angels Peak-Gallup Pool. Is that Exhibit No. 2?

A Yes, sir.

(Whereupon, El Paso's Exhibits Nos. 2 and 3 marked for identification.)

Q And El Paso's Exhibit No. 3 shows the gas-oil ratios of



the wells in this pool, is that right?

A Yes, sir, that's correct.

Q Mr. Rainey, do you have any recommendation or conclusion with respect to the special rules for Angels Peak-Gallup Oil Pool?

A Yes, it is our recommendation that the present field rules be extended for another year, and I believe that it will probably be more apropos to make it on a temporary basis, as is the current rule, so that as we gain more production performance history in this pool we can definitely determine whether or not these rules should be made permanent.

There is no evidence, affirmative evidence at this time that the rules should be changed. There is no evidence that the gas-oil contact has moved appreciably. There has been some change in gas-oil ratios, as would be expected, and I'll discuss those in a moment, but in general, we feel that the present rule should be continued.

Q Will you go ahead and explain the exhibits, El Paso's Exhibits 1, 2, and 3, and explain on what you base your conclusions and recommendations with regard to the special rules of this pool?

A Yes, sir. The plat, Exhibit 1, shows in the dashed, the heavy dashed outline, the short dashes, the pool limits as they were defined at the time of the last hearing in this case. I have shown in red in Section 19 of 27 North, Range 10 West, the West

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Half of that Section and the Northeast Quarter of that Section have been added to the pool limits since the time of the last hearing on this matter; and in 26 North, Range 10 West, the North Half of Section 11 and the South Half of the South Half and the North Half of the Southwest Quarter of Section 2 have been added to the pool limits. There's been no other change in the limits of the pool other than the addition of those two relatively small tracts of acreage.

There have been three new producing wells drilled in the pool, two of them in Section 19 of 27 and 10, and one in Section 11 of 26 and 10; and there has been one dry hole drilled in the Northwest Quarter of Section 12, 26 and 10 since the time of the last hearing.

The wells shown on this exhibit are only Gallup wells. The other development in the area, the Pictured Cliffs, is not shown, only the Gallup wells are shown. The small "d" under a number of the wells indicate that they are dual completions in the Gallup and the Dakota. I think that's essentially all that that plat shows.

Exhibit 2 is a set of production performance statistics on the pool since its original production in 1958, brought down through the month of March, 1962. As you can see, we have shown the monthly oil production, the monthly gas production, the actual field producing gas-oil ratio for each month, and the cumulative total oil and gas production from the field. I think it's



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interesting to note that for the last three years the gas-oil ratio has gradually increased. The producing gas-oil ratio for the pool for the year -- and bear in mind that the ratios have varied somewhat from month to month, dependent on what wells have actually been on the line or how much production has actually been taken from the pool, but that the year 1959, based on the total production for the year, the pool gas-oil ratio was 33,500 cubic feet per barrel; for the year 1960, it was 35,000 cubic feet per barrel; and for the year 1961 it was 62,500 cubic feet per barrel. The ratios have in general climbed, as would be expected in a reservoir of this kind, I think. I know of nothing particularly significant to point out on this Exhibit 2, other than the overall cumulative figures, and you can see that the gas-oil ratios have steadily climbed but have varied somewhat from month to month, dependent on the individual well that happened to be producing at that time.

Exhibit 3 is a gas-oil ratio performance history data sheet from July, 1960, for each quarter through April, 1962, which is the last gas-oil ratios we have available. Now in general the gas-oil ratios in the pool, as can be seen from these individual well gas-oil ratios, have tended to increase. It is significant, I think, to note that in some cases the gas-oil ratio performance appears to be somewhat erratic on an individual well. I think that can be accounted for by the fact that, for the most part, the wells in this pool produce relatively small volumes of



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oil in relationship to the volumes of gas which they produce, and just a few barrels change in oil production in any given month when they may be taking the official gas-oil ratio test will result in a fairly substantial change in the tested gas-oil ratio; but as far as the actual producing month-to-month gas-oil ratio, in most of these wells it has climbed slightly throughout the history of the pool.

One well in particular I might call to your attention is the Pan American Frost B-1, which was classified as an oil well at the time of the last hearing. That well is now classified as a gas well, and as you can see, has a gas-oil ratio of 210,000 to 1. That well has declined so markedly in oil production that although it's not producing any more gas than it was before -- it's located in Section 27 of 27 and 10, and that well, because of the marked decline in oil production, has an apparently very high gas-oil ratio, but these last, for the last year or so the gas-oil ratios tested on that well were based on less than one barrel of oil production; so just a minor fraction of a change in the amount of oil produced can make a very drastic and substantial change in the gas-oil ratio, even though the gas production has not gone up.

We believe from the evidence, if you realize the reason for that tremendous increase in the gas-oil ratio on the Frost 1-B, that there has been no marked movement of that gas-oil contact since the time of the last hearing.



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Q Mr. Rainey, what do the numbers in parentheses mean?

A Pardon me, I missed that; but the numbers in parentheses after the gas-oil ratios on certain of the wells are the wells that are classified as oil wells, and those numbers are the oil producing rates on those wells as reported on gas-oil ratio tests for that period of time. I might add that I took these gas-oil ratios directly from the proration schedules for the months in which there should have been a change in gas-oil ratio. If there have been other gas-oil ratios taken on some of these wells, and I know that there have been on some of them, I did not pick up any intervening gas-oil ratios. These are the ones that appeared on the proration schedules, the oil proration schedules for the month in which it was intended that the ratio should change. You can see the gradual decline in oil production on every one of the oil wells.

Q In your opinion, the special field rules have been working and should be extended for another year, is that correct?

A Yes, sir.

Q From what date?

A It's my understanding that the present rules provide that they shall continue in force until changed. There is a provision in the order as it now stands that this matter would come up for rehearing, for a redetermination as to whether or not the rules should continue or not, in April of this year by the terms of the order itself. At that time this hearing was continued



until this date. It's my understanding that unless changed, those rules will remain in effect.

It's my recommendation that we come back a year from today, or the June hearing in 1963, to review the matter again.

Q Were El Paso's Exhibits 1, 2, and 3 prepared by you or under your supervision?

A Yes, sir, they were.

MR. WHITWORTH: We ask that these exhibits be admitted.

MR. PORTER: Yes, sir. Any questions concerning the exhibits? They will be admitted to the record.

(Whereupon, El Paso's Exhibits 1 & 2 admitted in evidence.)

MR. WHITWORTH: That's all we have.

MR. PORTER: Anyone have a question of Mr. Rainey?

MR. MORRIS: Yes, sir.

MR. PORTER: Mr. Morris.

CROSS EXAMINATION

BY MR. MORRIS:

Q Mr. Rainey, is the Brown-McAdams Well No. 3 classified as an oil or gas well at this time?

A Based on its ratio, the last ratio in April, 1962, of 36,786 to 1, it should be classified as a gas well. However, there was no change in the classification on the June oil proration schedule from which this ratio was picked up. The rules provide that when wells have ratios in excess of 30,000 to 1, they should



be classified as gas wells. Again, that well, I think, because of the decline in oil production, just a barrel or two one way or the other makes a substantial difference in the calculated ratio.

Q In your opinion, Mr. Rainey, has the 30,000 to 1 dividing line between oil and gas wells been a realistic one?

A I think so. It seems to have worked out pretty well.

Q Has the gas-oil ratio of 2,000 to 1 been any handicap in the production of the oil wells?

A Not to my knowledge. El Paso has no oil wells and I'm not -- excuse me, we have a number of oil wells.

Q Yes.

A Excuse me. To my knowledge, there has been no particular handicap. I was thinking a hearing ahead of us.

Q Mr. Rainey, do you have any information with respect to the Brown-McAdams Well No. 5 as to why that well has been plugged and abandoned?

A It is my understanding that they drilled that extra well in that section, they have only one section in that pool and they drilled that extra well in that section to get additional oil allowable; and it's my understanding that it was uneconomical to produce the well. I'm not specifically familiar with the details on it. I might add all my other testimony has been in regard to this pool. I don't want to get that confused.

Q Upon what do you base your conclusions that there has



been no substantial movement of the gas-oil contact in this pool?

A Well, the ratios in the oil of the pool, in the oil zone of the pool have increased, but it would appear to me that the increase has been what would normally be expected in an oil well of this kind. Had there been any marked movement of the gas-oil contact, it would seem reasonable that the gas-oil ratios of some of those oil wells would have climbed very rapidly, and the only one that has climbed very rapidly has been the Pan American Frost B-1, which as I explained is because of the very marked decline in oil production on that well.

MR. MORRIS: I believe that's all I have. Thank you.

MR. PORTER: Does anyone else have a question of Mr. Rainey? The witness may be excused.

(Witness excused.)

MR. BUELL: May it please the Commission, Mr. Eaton was not fast enough on his feet and did not get sworn.

(Witness sworn.)

GEORGE W. EATON

called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. BUELL:

Q Mr. Eaton, would you state your complete name, by whom you are employed, and in what capacity and what location, please?

A George W. Eaton, Jr., Senior Petroleum Engineer for Pan



American Petroleum Corporation in Farmington, New Mexico.

Q Mr. Eaton, you've testified at prior Commission hearings and your qualifications as a Petroleum Engineer are a matter of public record, have you not?

A Yes, they are, and I likewise have testified in this case previously.

Q Mr. Eaton, would you look now at what has been marked as Pan American's Exhibit No. 1 and state for the record what that exhibit reflects? Pardon me, Exhibit 1-A so we can avoid confusion with past exhibits that we might have entered in this case.

(Whereupon, Pan American's Exhibit No. 1-A marked for identification.)

A All right. Exhibit No. 1-A is an isopac map of the Angels Peak-Gallup Pool. It is a map of that portion of the San Juan Basin which includes the Angels Peak-Gallup Pool. The sand thicknesses of the Angel Peak-Gallup Pool are shown with the contour lines contoured on a ten-foot contour interval.

Q Mr. Eaton, how have you distinguished the wells that are completed in the Angels Peak-Gallup Pool?

A The Angels Peak-Gallup Pool wells are colored in yellow.

Q Have you distinguished in any manner those wells that have been drilled subsequent to the last hearing in this case?

A Yes, sir. There have been three producing wells drilled in the Angels Peak-Gallup Pool since the last hearing, and one



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dry hole. The three wells which are producers are colored in yellow with an outer brown circle.

Q What is the significance of the numbers opposite each well, Mr. Eaton, that are colored in red and green?

A The gas-oil ratio of each well that existed at the time of the last hearing is colored in red, has a red number beside that well. The green number immediately underlying the red number is the gas-oil ratio of that well as of the latest date.

Q What is the orange line that traverses this pool, Mr. Eaton, on Exhibit No. 1-A?

A The orange line is the estimated gas-oil contact. You will note that it is depicted at a structural elevation of plus 430 feet. This is the same structural elevation at which the gas-oil contact was estimated at the time of the last hearing. The line has not been changed except for a better structural control which was provided by the additional wells which have been drilled since that time.

Q Are you in agreement with Mr. Rainey's conclusion that in this interim period since these pool rules were adopted, there has been no substantial movement one way or the other of the gas-oil contact?

A Yes, sir, I am. As a matter of fact, it appears to me that there has been remarkably little change, that the gas-oil contact has been remarkably stable during this interim period.

Q Would you care to comment on our Frost B-1? I think



Mr. Rainey very clearly covered it. Do you have any other additional information in that regard that you would like to contribute relative to that gas-oil ratio's performance?

A I agree, I think Mr. Rainey adequately covered it, but I would add this. I don't want to say that the gas-oil ratio shown of 210,000 is not representative, but I do believe it's meaningless. The well declined both in gas and oil production to such an extent that it is now, in the company terminology, shut in, temporarily abandoned. It is not intended that the well be produced any more. It became uneconomical to operate, and this gas-oil ratio was measured sometime before it completely became uneconomical to operate. I believe it's meaningless.

Q If the gas-oil contact had moved to that well, we could operate it economically as a gas well, could we not, Mr. Eaton?

A Yes, sir.

(Whereupon, Pan American's Exhibit No. 2-A marked for identification.)

Q Would you look at our Exhibit No. 2-A and briefly state for the record what that exhibit shows?

A Exhibit No. 2-A is a tabulation showing the bottom hole pressures of the new wells which have been completed in the Angels Peak-Gallup Pool since the time of the last hearing. This exhibit also shows the initial reservoir pressure in the Angels Peak-Gallup Pool, showing that pressure to be 1620 psig. In the case of each of the three wells which have been completed, the



initial bottom hole pressure on each of the wells was substantially less than the original bottom hole pressure. Each of these three new wells are isolated at a location substantially far from the nearest producing well at the time that the new well was completed.

Q So these new data which have been acquired subsequent to the last hearing also indicate that in this pool, a gas well will effectively and efficiently drain in excess of 320 acres?

A Yes, sir.

Q Mr. Eaton, more or less by way of summary, have you seen any new data which we have acquired in this interim period which would indicate to you in any way that the current rules are not the proper rules for this pool?

A I have seen no new data which have been acquired since the last hearing which would suggest to me that these rules aren't functioning properly in maintaining a stable gas-oil contact and adequately protecting the correlative rights of the gas operators as well as preventing the waste of the oil in the oil area by permitting an upward movement of the gas-oil contact.

Q Mr. Eaton, what is your engineering recommendation to the Commission with respect to the continuation of these rules?

A It is my recommendation that these rules be made permanent.

Q Do you see any necessity for keeping them on a temporary basis of another year?



A No, sir. I believe that the data which have been obtained during the past two years should be sufficient to extrapolate into the future, so that if it has worked properly the last two years, we can satisfactorily conclude it will continue to do so.

Q And, Mr. Eaton, should the occasion develop, which we do not foresee now, that these rules would adversely affect anyone or adversely affect conservation, when this becomes known, of course, a hearing could be requested --

A Yes.

Q -- and the rules again considered.

MR. BUELL: May it please the Commission, that's all we have at this time; and may I formally offer our Exhibits 1-A and 2-A?

MR. PORTER: Without objection the exhibits will be admitted.

(Whereupon, Pan American's Exhibits Nos. 2-A & 2-B admitted in evidence.)

MR. PORTER: Does anyone have a question of Mr. Eaton?
Mr. Nutter.

CROSS EXAMINATION

BY MR. NUTTER:

Q To what do you attribute the fact that the workover on Huerfano Unit No. 110 is an oil well?

A Would you locate that well for me?



Q It's in Section 26 of 26, 10 -- I beg your pardon, Section 3.

A Section 3. It's my recollection, Mr. Nutter, that that is the anomalous well which was the subject of considerable discussion at the previous hearing. I didn't believe at that time that we ever could satisfactorily explain the low gas-oil ratio on the Huerfano Unit 110, and I still can't.

Q It's still an anomaly, then?

A Yes, sir, although less so than at the time of the last hearing. According to the data shown on this Exhibit 1-A, the gas-oil ratio at the time of the previous hearing was in the range of 7,000 cubic feet per barrel and is now 16,400 cubic feet per barrel. It appears that it might be approaching that area where it should be classified as a gas well.

Q It's the only old oil well south of your gas-oil line, I presume?

A No, sir. Huerfano Unit No. 108 which I kept looking at at the time that you brought this 110 up is classified actually as an oil well. It's immediately south of the gas-oil contact line. Apparently the gas-oil ratio in that well has changed very little in this interim period, but is still in the range which it would be classified as an oil well.

Q Doesn't it have a GOR of 125,000?

MR. MORRIS: You are referring to 105, are you not?

A Oh, excuse me, 105. 105 in the Southeast Quarter of

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Section 29, Township 27 North, Range 10 West.

Q (By Mr. Nutter) Oh, yes, it's close to the gas-oil contact?

A Yes, sir.

MR. NUTTER: Thank you. That's all.

MR. PORTER: Does anyone else have a question of Mr. Eaton?

MR. MORRIS: Yes.

MR. PORTER: Mr. Morris.

BY MR. MORRIS:

Q If the Commission should continue the rules in effect for another year as El Paso has suggested, and then have another hearing at that time, is it your opinion that we'll have any oil wells left in this pool or will they all have turned to gas wells in the meantime?

A It would be my opinion that there would still be oil wells left under these pool rules.

Q Two or three of them?

A Yes, sir. In that regard, I don't believe that there have been any which have passed over in the last two years. I don't believe, with the possible exception of this Brown, Weaver-Brown No. 3 which was mentioned previously, so I don't believe that another year's history will make any appreciable number of wells pass over from oil to gas classification.

MR. MORRIS: Thank you.

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MR. PORTER: Does anyone else have a question? The witness may be excused.

(Witness excused.)

MR. PORTER: Does anyone else have any testimony to offer in this case, 1641? Any statements? Mr. Whitworth, do you have a statement to make?

MR. WHITWORTH: May it please the Commission, El Paso has no objection to making the rules permanent, as has been recommended by Pan American. We can always come back in for another hearing if that doesn't prove satisfactory.

MR. PORTER: If nothing further to be offered in Case 1641, the Commission will take it under advisement.

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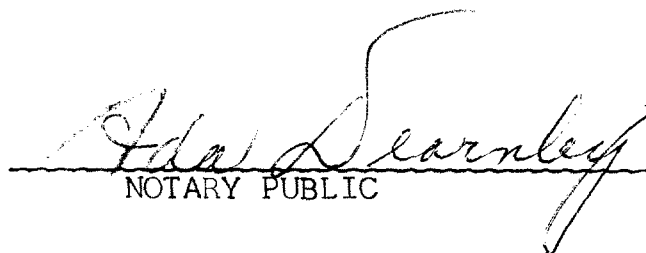
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STATE OF NEW MEXICO)
)
 COUNTY OF BERNALILLO) ss

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me in steno-type and reduced to typewritten transcript under my personal supervision; that the same is a true and correct record of said proceedings to the best of my knowledge, skill and ability.

WITNESS my hand and notarial seal this 25th day of June, 1962.


 NOTARY PUBLIC

My Commission Expires:
 June 19, 1963.

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