BEFORE THE OIL CONSERVATION COMMISSION
SANTE FE, NEW MEXICO
March 14, 1957

IN THE MATTER OF:

Application of Amerada Petroleum Corporation for an order promulgating pool rules, instituting gas prorationing, creating a new gas pool and redelineating existing oil and gas pools in the Pennsylvanian formation underlying all or portions of Sections 33, 34 and 35 of Township 11 South, Range 33 East, and Sections 2,3,4,10 and 11 of Township 12 South, Range 33 East, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order covering the following points:

CASE NO. 1220

(1) Extension of the horizontal limits, and restrict the vertical limits of the Bagley Pennsylvanian Gas Pool to the 9800 foot zone of the Pennsylvanian formation.

(2) Create a new gas pool for the 8600 foot zone of the Pennsylvanian formation underlying all or portions of the SW/4 SW/4, E/2 SW/4, SE/4, SE/4 NE/4 Sec. 33; S/2, S/2 N/2 Sec. 34; in Township 11 South, Range 33 East; and the N/2, N/2 SE/4 Sec. 4; N/2, N/2 SW/4, SE/4 Sec. 3; W/2 SW/4 Sec. 2; NE/4 Sec. 10; W/2 NW/4 Sec. 11, Township 12 South, Range 33 East, Lea County, New Mexico.

(3) Restrict the vertical limits of the Bagley Pennsylvanian (Oil) Pool to that zone lying between the two proposed gas pools.

(4) Promulgate pool rules for both of the proposed gas pools providing for gas prorationing and 640-acre spacing therein.

Before: The Honorable Edwin L. Mechem
Murray Morgan
A. L. Porter

MR. BUSHNELL: Mr. Chairman, I would like to make a statement for the record before we prepare with swearing the witnesses or before we start presenting testimony.

MR. PORTER: You may.

MR. BUSHNELL: This is Amerada's Application for delineating horizontally and vertically two sand formations, gas sand formations, in the Pennsylvanian zone of the Bagley field. We have, in presenting our exhibits, sometimes referred to the upper sand as the Permo Pennsylvania, but it can be referred to as the upper Pennsylvanian sand formation 8600 foot. In our exhibits, as to the lower formation, we have referred to that as the Pennsylvanian sand and sometimes as the 9800 foot sand. The manner in which we are presenting this evidence may be, may appear confusing. We will make every effort not to do so, but in presenting our exhibits, we have duplicate purposes in presenting exhibits, (1) first always as to the upper 8600 foot sand and next in order will be a similar exhibit as to the lower 9800 foot sand.

(Marked Amerada's Exhibits No. 1 through 6 for indentification).

R. S. CHRISTIE, having been first duly sworn testified as follows:

DIRECT EXAMINATION

BY MR. BUSHNELL:

Q Would you state your name and the company for which you are employed?

A R. S. Christie, Amerada Petroleum Corporation.

Q In what capacity are you employed?

A Petroleum Engineer.

Q Have you appeared as a witness and testified before this Commission in that capacity on prior occasions?

A Yes, sir.

Q Mr. Christie, I hand you what is marked Exhibit No. 1. For the benefit of you who do not have copies, here is Exhibit No. 1. Was this prepared by you or by one under your supervision?

A Yes, sir.

Q Will you state what it represents?

A Exhibit No. 1 is a structure map drawn on top of the Permo-Pennsylvanian or the top of the upper Pennsylvanian gas zone, contour interval twenty feet.

Q What controls did you use in drawing those contour lines?

A Those points were selected from electric logs.

Q Is that true as to all of the area covered?

A Yes, sir.

Q Noted also are the lines running north and south and those represent the area that will be included in the cross-section later?

A Yes, sir, the dashed line represents the line of cross-section for the north-south cross-section and the east-west cross-section.

Q All right. Now, referring to Exhibit No. 2, would you state what that represents?

A Exhibit No. 2 is a structure map drawn on top of the, what

we choose to call the 9800 foot Pennsylvanian zone or you might call it the lower Pennsylvanian gas zone, on a contour interval of twenty feet. Likewise the points of control on this Exhibit were taken from the electric logs. Outlined in green, I should have mentioned, Exhibit No. 1, the outline in red is the limits of what we think are producing, what we think is the producing area. The outline in green on Exhibit 2 is the outer limits of what we think is the productive limits of the 9800 foot zone.

Q Exhibit No. 2 was also prepared by you or one under your supervision, isn't that correct?

A Yes, sir.

Q Referring to the proposed outline of this pool and referring to Exhibit No. 3, which is this one, would you state, was that prepared under your supervision?

A Yes, sir.

Q What does that purport to show?

A Exhibit 3 is a plat showing the outline of what we interpret to be the productive area of the upper Pennsylvanian gas zone. This control was based on drillstem tests and also on electric logs.

Q I'll hand you what is marked Exhibit No. 4, was this prepared under your supervision?

A Yes, sir.

Q Would you state what that represents?

A Exhibit No. 4 depicts what we consider to be the pool out-

line of the lower Pennsylvanian gas zone or what we designate as the 9800 foot zone.

Q Now, referring to both Exhibits 3 and 4, insofar as they relate to the particular specific formations, Exhibit No. 3 as the upper 8600 zone and No. 4 relating to the lower or 9800 foot zone, in drawing your proposed outline of the area,did you have equal control throughout?

A No. You'll notice on the west side of the field, we had no control and that area was more or less picked from structure, in other words, using our structure maps shown in Exhibit 1 and 2, so there may be some question about the limits of production on the west side of the field.

Q So that whereas on the east side of each of these two areas the limits are based on controls from wells in which we know that represents the eastern limit of the productive portion of the formation, on the western portion you had to draw it on the basis of the structure, is that correct?

A Yes, sir.

Q Now, Mr. Christie, I hand you what is marked Exhibit No. 5. Was this prepared under your supervision?

A Yes, sir.

Q Would you state what that represents?

A Exhibit No. 5 is an east-west cross-section through the Bagley field, starting with Texas Pacific Coal and Oil Company State C Account No. 2 well No. 1 and going eastward through

Amerada's Caudle #2, Caudle #7 and Amerada's Mathers "A" #2, Amerada's Caudle #5 and Amerada's State BT "I" #1 and Amerada's State BT "C" #1, and Amerada's State BT "D", #5 and 3.

Q Now I hand you what is marked Exhibit No. 6, was this prepared under your supervision or by one under your supervision?

A Yes, sir.

Q Would you state what that represents?

A Exhibit No. 6 is similarly a cross-section through the Bagley field in a north-south direction, which begins with Amerada's the Caudle #1, going north to Caudle #3, Amerada's Mathers #2 and Mathers #1, and Amerada's Caudle #5 and Amerada's BT "N" #1, and incidentally that is Amerada Gulf BT "N" #1 and Amerada's BL "N" #1.

Q What do these two Exhibits No. 5 and 6 purport to show with reference to the upper and lower Pennsylvanian formations?

A These Exhibits show the producing zones, the two producing zones, the upper gas zone which on Exhibit No. 6 is indicated in yellow and the interval between the upper gas zone and the top of the oil zone and the bottom of the oil zone and the interval between the bottom of the oil zone and the top of the lower gas zone which is designated the 9800 foot zone which is also colored in yellow, where productive.

Q Now, Mr. Christie, would you locate on Exhibit No. 4 and describe its location, of the Amerada Caudle #7 well. You could locate it on Exhibit No. 1.

A Amerada's Caudle #7 is located in the Northeast Quarter of the Northwest Quarter of Section 3, Township 12, South Range 33 East.

Q In what manner is that well now completed?

A The Amerada Caudle No. 7 was originally completed in the Pennsylvanian zone and has been depleted of oil production. It has since been re-completed as a dual producer in the two gas zones, the upper and the lower gas zones as shown on Exhibit No. 6 and also on No. 5.

Q Now, in your application you have stated that in this well you found the location of the two formations as follows: The upper sand, the top of which is at 8589 feet and the base of the upper sand at 8645 feet. The top of the lower sand is at 9756 feet, and the base of the lower sand at 9925 feet. Were these figures picked from the log on the Caudle #7?

A Yes, sir, they were.

Q Do you propose that these locations be vertical limits of each formation as depicted by the Commission in its Order?

A Yes, sir.

(Marked Amerada's Exhibit No. 7 for identification.)

Q I hand you what is marked as Exhibit No. 7. Was this prepared by you or one under your supervision?

A Yes, sir.

Q Would you state what it is and what is represented hereon?

A Exhibit No. 7 is a tabulation of all drillstem tests taken in the upper 8600 foot zone and the lower 9800 foot zone and this information was the information that was used in determining the limits of production.

Q For the purpose of delineating the respective pools vertically?

A That's right, yes, sir.

Q Correction, horizontally.

A Yes, sir.

Q Now, from the study you have made and from the data that is shown on this Exhibit No. 7, what conclusions have you made as to the minimum amount of acreage that one well can drain in each of these two zones?

A Based on the potentials as shown on some of these tests, based on bottomhole pressures, and based on micro logs, and further on a calculation that I have made, I believe that one well will efficiently drain at least 640 acres.

Q What calculation have you used in reaching that conclusion?

A For the upper 8600 foot Pennsylvanian gas zone, I have used an average pay thickness of 15 feet, porosity of six per cent, water saturation of twenty per cent, original bottomhole pressure of 2931, and the most recent bottomhole pressure of 2586 pounds. The cumulative production for this zone which was produced incidentally from our Mathers "A" #2, which is now classified as an oil well, but in fact is a high, extremely high,

ratio well or distillate well at the present time, this well has produced 1,393,000,000 MCF, 98,000 barrels condensate, 4,344 barrels of water. Converting that into fluid, we estimate that the gas originally in place was 406.262 MCF. The gas now in place using the same factors equals 316.984 MCF. By calculation, we find the area being drained is 33,655 acre feet. Based on a 15 foot pay thickness the total acres would be 2244 acres.

Q Now, you're referring to the upper formation?

A Referring to the upper formations. As to the lower 9300 foot zone, using an average pay thickness of 20 feet, per cent porosity of six per cent, water saturation of twenty per cent, original bottomhole pressure of 3604 pounds per square inch and the most recent of 3200 pounds per square inch, we have gone through the same calculation and found that the area being drained by one well in the 9800 foot zone is 1890 acres. Therefore, I concluded from those calculations that one well will drain at least 640 acres.

Q Now, Mr. Christie, what do you recommend as to the method of allocation for the rules which you are requesting here?

A We would suggest a straight acreage allocation.

Q You also recommend that the Commission authorize the formation of units of less than 640 acre units, is that correct?

A Yes, sir.

MR. BUSHNELL: That's all the questions I have at this time.

MR. PORTER: Does anyone else have a question?

MR. CHRISTIE: I might point out for the record, the potentials in the Caudle #7 well, which is dually completed was 6,900,000 for the lower 9800 foot zone, and 7,850,000 for the upper 8600 foot zone. Those tests have been turned into the Commission, back pressure tests.

MR. PORTER: Mr. Campbell.

MR. CAMPBELL: Jack M. Campbell, Campbell and Russell, Roswell, New Mexico, appearing on behalf of Texas Pacific Coal and Oil Company.

CROSS EXAMINATION

By MR. CAMPBELL:

Q Mr. Christie, you have referred in your testimony to the basis for the outline of the pool limits as being the study of the drillstem tests in these productive zones, will you state how many wells are actually producing in those zones at this time?

A From the two gas zones in question?

Q The 8600 foot zone first.

A At the present time there is just one well producing from the 8600.

Q Where is that well situated?

A That is Amerada's Mathers "A" #2 situated in the Southeast Quarter of the Southeast Quarter of Sec. 3, Township 12 South, Range 33 East.

Q That well is still classified as an oil well, is it not?

A Yes, sir.

Q As the distillate production has fallen off in that well, has not the gas production also fallen off?

A Well, of course, it is pretty hard to tell. We are limited to the amount of gas we can produce from an oil well. I am not positive whether it would fall off.

Q You don't know whether it has fallen off in relation to the proportion of distillate?

A No.

Q The only production history you have and the only actual producing well from the 8600 foot zone is the producing well that you have referred to as Mathers #2?

A Yes, except for the potentials on Caudle #7.

Q You have never produced that?

A No, sir, except to take a potential.

Q Are you from your study satisfied that the entire zones that you show on your Exhibits 5 and 6, all of those zones contain sufficient porosity for production of gas from these two zones?

A I believe so, yes, sir, except for the possibility the western area which we indicated before might be questionable. We are not positive about western limits.

Q In delineating the 8600 foot pool that you have suggested in your Exhibit No. 3, you have relied upon production, actual production from only one well, is that correct?

A Yes, sir.

Q With regard to the 9800 foot zone, how many wells are actually producing from that zone and where are they located?

A At the present time there are two wells completed in the 9800 foot zone. They are the Shell Amerada State "A"-#1, located in the Southeast Quarter of the Southeast Quarter of Sec. 33, Township 11 South, Range 33 East, the Texas Pacific Coal and Oil Company State "C", Account 2, #1 well located in the Northeast Quarter of the Northeast Quarter, Sec. 4, Township 12 South, Range 33 East.

Q The Texas Pacific well is a direct offset to the Amerada Shell well, is it not?

A Yes, sir.

Q Were the bottomhole pressures that you referred to in the calculations for the 9800 foot zone bottomhole pressures from your Amerada Shell well?

A Yes, sir.

Q Those as I understand it were 3604 original and 3200 recently.

A Yes, sir.

Q Do you have the bottomhole pressures on the Texas Pacific Coal and Oil Company well?

A No, sir.

Q If the present bottomhole pressure on the Texas Pacific well was 2627 pounds, what would that indicate to you, insofar as

its relationship with your Amerada Shell well is concerned?

A Well, I would like to know how long that has been shutin, how long has it been shutin for buildup. It indicates a low permeability.

Q Does it indicate perhaps a complete lack of communication between the two wells?

A No, I don't think so.

Q All of the wells that have been drilled thus far and are producing from these gas zones have been drilled upon the State-wide 160-acre spacing, have they not, Mr. Christie?

A I assume so, yes.

Q At least the two wells that you referred to as being the only producing wells in the 9800 foot zone are direct offset?

A Yes, sir. Actually the Shell well was drilled on an 80-acre tract and was later commutized with an 80-acre tract with Amerada.

Q The 80-acre tract to the west of the Amerada State well has been communtized?

A Yes, sir.

Q Are you presently planning to drill an additional well in Section 33?

A Yes, sir, we have a location in the Northwest Quarter of Section 33.

Q Are you presently working over a well in the Southwest Quarter of Section 28?

A We are presently attempting a completion in a well in that section.

Q Do you feel that the drilling of the additional well and the possible completion of the well in Section 28 will give you additional information concerning these two gas zones?

A It will give us additional information, as to that particular area. I don't think it will help us any from the Shell well and the Texas Pacific well east to the limits of the producing, what we choose to call the producing zone.

Q You have stated that your Caudle #7 well is **dually completed.** From what zone are you now producing that?

A It is not being produced.

Q It is shutin completely?

A Yes, sir.

Q Has it produced?

A No, sir, except to take potentials.

Q So that you have no production history on that well either?

A No, sir.

Q Then it comes down to the proposition, does it not, Mr. Christie, that the only actual information that you have concerning these two gas zones is as to 8600 foot zone, the information you have obtained from the production from your Mathers #2 oil well and the potential from that zone on your Caudle #7 well?

A That is true, except when we completed our Caudle #7, we took a bottomhole pressure in both zones which in effect was an

interference test and we found that the pressure in the #7 has been reflected by the production from both of the producing, at least from the, I assume the Shell and the Texas Pacific well and also from the Mathers "A" 2.

Q The only information you have with reference to the 9800 foot zone is the information obtained from the production from your Amerada Shell well and the Texas Pacific well, plus your potentials on the Caudle #7, is that correct?

A Yes, sir.

Q Upon that history, you believe the Commission should delineate this pool to the extent that you have set out in Exhibits 3 and 4?

A I think it's sufficient evidence, yes, sir.

Q If the Commission should see fit to set up 640 proration unit, what acreage do you plan to attribute to your Caudle #7 well?

A We would request that the Commission approve the North Half of Section 3 of the South Half of Section 34 in Township 11 South, Range 33 East, and the North Half of Section 3, being in Township 12 South, Range 33 East.

Q Would you plan to make any effort to attribute additional acreage to your Amerada Shell well?

A That would depend on the, possibly on the results of this test that is being drilled up here.

Q Until that test is completed, you don't know whether the rest of that section may be productive or not, do you?

A No, sir.

Q Have there been any interference tests as between wells in the same gas zone in this field?

A Yes, at least I call these interference tests. The original pressure on the Shell Amerada State "A"-#1 was 3604 pounds, the latest pressure that we obtained was I think I reported, was 3200. We took that was sometime in February, we took a bottomhole pressure in that same zone in our Caudle #7 which showed a bottomhole pressure of 3239, which is a fairly good check for that distance, similarly in the 8600, the original pressure in this reservoir, we obtained by averaging six drillstem tests, which gave us an average of 2921 pounds, I believe it was 2935 pounds, 31 pounds. We took a pressure February 12th. Our pressure had declined to 2506 in our Mathers "A"-2. In our Caudle #7 at the same depth our pressure was 2665, showing that this area had declined along with the production from that one well that far away.

Q You believe that the comparison of bottomhole pressures in wells in the same zone is a pretty good indication of the reservoir condition?

A That is a good indication of the communication.

Q Mr. Christie, what is the approximate cost of these wells?

A It would cost about $200,000 to drill a well to the 9800 foot zone.

Q Do you know how much gas has been or is being sold from

your Shell Amerada Shell well?

A I believe it's approximately a million a day.

Q At the approximate price of ten cents?

A I believe so, yes, sir.

Q How much distillate are you selling from that well?

A I can't answer that specifically.

MR. ABBOTT: About eighty barrels a day.

Q How much do you get from your distillate?

A I assume the top price for crude oil.

Q Have you made any calculations as to the payout on the well in the 9800 foot zone?

A No, sir. We hadn't planned to drill another 9800 foot zone, we weren't interested in payout.

MR. CAMPBELL: I believe that's all.

MR. PORTER: Mr. Mankin.

BY: MR. MANKIN:

Q Mr. Christie, you indicated that you had pretty good communication as regards pressure information in the Shell Amerada State "A" well-#1 and the Amerda Caudle #7, approximately 3200 pounds at the present time pressure, is that correct?

A Yes, sir.

Q Do you have any explanation at all for this some 600 pounds lower in the Texas and Pacific well just south of the Amerada Shell State Well?

A I think it's probably just low permeability or could be caused by a method of completion, I don't know. The log looks practically as good as the Caudle #7 or the Shell well. It appears as though it ought to be practically as good a well as the Shell well.

Q Do you have any drillstem tests of this 9800 foot zone in any other portion of the pool that might back up from what you think about good communications?

A Well, the drillstem tests that we have taken are all shown on Exhibit 7.

Q Weren't they all the 8600 foot zone?

A There is a page two that has 9800 zone.

Q It would be rather hard to tell anything from that. Pressures are not, possibly not, maximum or cleaned up on those enough to tell if you have good communication over the reservoir.

A The only thing you could say if you had a rapid buildup and a high pressure, it would be pretty indicative, but if you do not, there would be some question about it.

MR. MANKIN: That is all.

MR. PORTER: Mr. Cooley.

BY MR. COOLEY:

Q Mr. Christie, as you know the present vertical limits of the Bagley Pennsylvanian Oil Pool include the Pennsylvanian formation?

A Yes.

Q Both the 8600 and 9800 foot zones are in the Pennsylvanian formation, aren't they?

A Yes, sir.

Q Some of the horizontal limits of the Bagley Pennsylvanian Oil Pool, some of the area in Bagley Pennsylvanian Oil Pool is included in the horizontal limits of the 8600 and 9800 foot zones, as you outline them on your Exhibits?

A Yes, sir.

Q What then would you propose the vertical limits of the Bagley Pennsylvanian Oil Pool should be in that we cannot have an oil pool and a gas pool at the same point?

A I think you could take them off pretty well from Exhibits 5 and 6 and possibly pick the highest well structurally and down to the water zone and call that your vertical interval in your oil zone.

Q Is the structure common enough through the area affected here that vertical limits set out in numbers of feet rather than in formation and markers feasible?

A I think so, yes.

MR. COOLEY: That's all.

MR. PORTER: Do you have a question of the witness, Mr. Utz?

BY MR. UTZ:

Q You may have answered this, if you did I didn't catch it. If this application is granted, what would you propose to dedicate

to your Mathers #2 in the Southeast Quarter of Section 3 for the 8600 foot zone?

A We would probably ask that the, well everything within the dashed lines shown on Exhibit 3 up to the gas unit that we would assign to Caudle #7, with the possible exception of the North Half of the Southwest Quarter of Section 3. To be specific we would ask for the Northeast Quarter of Section 10, the West Half of the Northwest Quarter of Section 11 and the West Half of the Southwest Quarter of Section 2, and the Southeast Quarter of Section 3, all in Township 12 South, Range 33 East. We may possibly ask for the North Half of the Southwest Quarter of Section 3, I don't know. There may be some question about the North Half of the Southwest Quarter.

Q You would not propose to drill anymore wells to the 8600 foot zone then on your acreage in this area?

A No, sir. We contemplate that if we felt the area wasn't completely developed eventually, we will have other producing wells that we can recomplete into these gas zones.

MR. UTZ: That's all I have.

MR. PORTER: Mr. Mankin.

BY MR. MANKIN:

Q How do you propose to develop the 9800 foot in the south end of this area which you presently do not have any well dedicated to you? Do you anticipate drilling another well or to

convert another well, how do you propose to do it. You don't have anything deep enough there, do you?

A We hadn't intended to develop a well for that purpose at this time. We would probably wait until we get an old oil well that had been depleted.

Q Possibly an old well in the Siluro Devonian?

A Yes, sir.

MR. MANKIN: That is all.

MR. PORTER: Mr. Cooley.

BY MR. COOLEY:

Q I have one further question. In the event this application is granted, there would be the necessity of promulgating pool rules as requested in the application. Are you familiar with the pool rules in the Crosby Devonian Gas Pool?

A General way.

Q With the exception of the spacing and well locations, would you suggest that rules similar to those having been promulgated in the Crosby Devonian be adopted for the two proposed gas pools in this case?

A I would rather not say without specifically checking those rules. I don't remember them well enough to make any comments on it.

MR. BUSHNELL: We think we could do a better job of

recommending in that respect if we were able to have some time to look over the specific order you are referring to.

MR. COOLEY: My thought was that we would need some record here on what the rules should be in the event the application should be granted.

MR. BUSHNELL: Did you have some specific rule in mind?

MR. COOLEY: We have a pretty standardized system now established as a result of the recommendations of the Gas Committee concerning marginal wells, classification of marginal wells. The assignment of allowables, they deviate very little from the existing gas rules throughout the State. Seven and six, thirteen, prorated gas pools in the State, six of those in the northwest.

MR. BUSHNELL: If I understand you correctly, I think with reference to your manner of allocation that Mr. Christie did testify that he recommended it based on acreage.

MR. COOLEY: Yes.

A I think either the Jalmat or the Eumont, where they would apply to the particular field would be satisfactory.

MR. COOLEY: Thank you.

MR. PORTER: Does anyone else have a question of this witness? Mr. Adair.

BY MR. ADAIR: I have one question. Eugene Adair, representing the Texas Pacific Coal and Oil Company.

Q Will you point to or locate on the Exhibit for the

benefit of the Commission your Mathers "A" #2?

A On Exhibit 1, Mathers "A", you say "A" #2?

Q "A" #2?

A "A" #2 is in the Southeast Quarter of the Northwest Quarter of Section 3, Township 12 South, Range 33 East.

Q Is there 80 acres that that well is located on within the proposed 640 acre unit that you ask for?

A Yes.

Q What did the well test on drillstem test in 9800 foot zone?

A It tested 4000 cubic feet.

Q Per what -- per hour, day or what?

A Per day.

Q You propose that you would receive 80 acres allocation for that tract?

A Yes, sir. Drillstem tests aren't always an indication of what a well will produce.

MR. ADAIR: That is all.

A If you get a good drillstem test you have some good information, if you don't you are not always sure. The fact that it did produce gas would indicate there was gas there, even though it was a small amount.

BY: MR. CAMPBELL:

Q Mr. Christie, that last statement, you based all your

calculations and assumptions on drillstem tests, haven't you?

A No, we used log, electric logs to some extent.

MR. PORTER: Are there other questions of the witness? Did you wish to submit your Exhibits?

MR. BUSHNELL: I would like to offer Exhibits 1 through 7 into the record.

MR. PORTER: Without objections, the Exhibits will be admitted.

The witness may be excused.

MR. PORTER: The meeting will come to order, please. Mr. Campbell, will you proceed with your examination?

JOHN YURONKA

called as a witness, having been previously sworn, testified as follows:

DIRECT EXAMINATION

BY MR. CAMPBELL:

Q Will you state your name, please?

A John Yuronka.

Q Where do you reside and by whom are you employed?

A I live in Midland, Texas and I am employed by Texas Pacific Oil Company.

Q In what capacity, Mr. Yuronka?

A Petroleum engineer.

Q Have you testified before this Commission on previous occasions in your professional capacity?

A Yes, sir, I have.

Q Are you acquainted with the application of Amerada in Case No. 1220 before the Commission?

A Yes, I am.

Q And in connection with that case, have you made a study of the Bagley area with reference to the gas zones for which the pool rules are requested?

A Yes.

Q Would you state generally what the nature of that study has been and what information you based your conclusions on?

A We used structure maps for both zones and then we drove some cross sections to show the net porosity, and I would like to make that point clear before we go any further. As can be seen, there is a marked difference between our cross sections and what Amerada has presented, and what we have shown. The red is the eighty-six hundred and the green is the ninety-six hundred foot zone. We have shown what we think is the productive part of the pay, and that included the whole pay as Amerada has in both pay zones. In other words, we have not included what we think will produce water or such items such as that, merely what we think will produce gas and distillate.

Q You have taken into consideration what you consider to be lack of, or low porosity, is that correct?

A Yes.

Q In each of the two gas zones?

A Yes.

Q Now referring to what is shown on the board there as TP Exhibit No. 1, will you state what that is?

A Exhibit No. 1 is a structure map of the eighty-six hundred foot pool, contoured in fifty foot intervals with the cross sections indexed.

Q And will you identify through the index, the various cross sections that appear on the board. I believe you have "AA" Prime over here, "BB" Prime, "CC" Prime and "DD" Prime.

A "AA" Prime is the cross section over there, and that starts with Amerada State Shell "A" No. 1 and goes east and includes Amerada's State BT "K" No. 1; State BT "N" No. 1; State BT "C" No. 4; and State BT "C" No. 1. Cross section "BB" Prime, which is this one, starts with Texas Pacific Coal and Oil Company State C Account No. 2 Well No. 1, and eastward, including Amerada Caudle, No. 2; Caudle, No. 7; Mathers 1-A; Caudle, No. 5 and State BT "I" No. 1. Cross section "CC" Prime, which is this one here, starts with Amerada BT "K" No. 1, goes down south to Caudle No. 7; Mathers A-2, and Mathers No. 3, and "DD" Prime, which is this one here on the board, starts out north with State BT "M" No. 1; goes south to include State BT "N" No. 1; Caudle No. 5, and Mathers No. 1.

Q And does Exhibit No. 2 there reflect the same information with reference to the eight hundred foot zone?

A Yes. Exhibit No. 2 is a structure map of the ninety-eight hundred foot pool and also the same cross section indexed as I have on the structure map of the eighty-six hundred foot pool.

Q Now referring to Exhibit No. 3, which is your "AA" Prime cross section over on this wall. Will you step over there and point out what your cross sections show? First state what information you used to--

A Well, these cross sections or correlations were done with the aid of our geological department and it does not indicate structure in any way whatsoever. We, all we have done is used the electric log and marked it off. We picked up the porosity which we thought was productive and if there was a drillstem test in that interval, it has been included in this cross section.

Q There were not drillstem tests in all instances?

A To my knowledge, I couldn't find them.

Q Will you go ahead and show by referring to your eighty-six hundred foot interval, what that particular "AA" Prime cross section reflects, referring first to the eighty-six hundred foot interval?

A This on the extreme left is Amerada's State Shell "A", No. 1 and from the micrologs taken in the eighty-six hundred foot pool, we couldn't find any porosity at all for the zone that Amerada is calling productive in that zone. And then in the State BT "K", No. 1, we found fourteen feet of porosity. State BT "N", No. 1--

Q Will you turn around so the Commission can hear you. Use your other hand.

A State BT "N", No. 1, we found two feet of porosity and State BT "C", No. 4, five feet of porosity. In the upper zone, Amerada has perforated 8582 to 8600; and 8624 to 8642, and this porosity shown here is in that upper perforation interval. And this BT "C", No. 1, there isn't any porosity at all. In this interval they haven't perforated at all, and I found six feet of porosity in that interval they have perforated.

Q Now, I would like you to refer to the other exhibits in

in the eighty-six hundred foot zone before you go to the ninety-six hundred foot.

A In cross section "BB" Prime, starting with the TP State C Account No. 2 Well No. 1, I found eighteen feet of porosity in the eighty-six hundred foot zone of that well, and I might add that is the most net foot of need porosity we found in any well in the eighty-six hundred foot.

Q Which well is--

A State C Account No. 2 Well No. 1, TP well. And Caudle No. 2, I found nine feet of porosity. Caudle No. 7, twelve feet, and at this point, I might show this particular item. In the bottom perforation interval for Amerada, 8624 to 8642, the micro-log showed a complete void of porosity. Mathers A-1 has seven feet of porosity and in Caudle, No. 5, in the State BT "I" No. 1, I couldn't find any porosity at all in the eighty-six foot hundred zone. Now, cross section "CC" Prime, BT "K" No. 1, of course, was on cross section "AA" Prime; forty-two feet of porosity, and of course, Caudle No. 7 is again included and Mathers A-2 had eight feet of porosity and Mathers No. 3, had six feet of porosity. And in section "DD" Prime, State--pardon me, State BT "M" No. 1 has eleven feet scattered porosity, State BT "N" No. 1 had two feet of porosity. Caudle No. 5, again didn't show any, and Mathers No. 1 had eight feet of porosity all in the six hundred foot zone.

Q Now referring the Exhibit marked TP, Exhibit No. 7 on the board, will you state what that is and explain to the Commission what it reflects with reference to these cross sections in the eighty-six hundred foot zone that you have been referring to?

A This is an isopach of net porosity for the proposed eighty-six hundred foot pool. This outline in red is what Amerada wishes to call the eighty-six hundred foot zone; outlined in yellow is the proposed proration units that will be asked by Amerada, six hundred and forty acres for Caudle No. 7, and from the application, I just presume it would be one hundred and sixty for Mathers No. 2. At this point, I would like to show that in the six hundred and forty acres being asked for Amerada's Caudle No. 7 in the eighty-six foot hundred zone, Caudle No. 5, right here shows no porosity, this portion right here shows no porosity.

Q That's the portion on the west edge of the southwest corner of the unit?

A Yes, and then here in the northwest quarter of the unit in approximately eighty acres, by our isopach, we show no porosity.

Q So that there would be acreage attributed to the six hundred and forty acre unit which, in your opinion, would not be productive of gas from the eighty-six hundred foot zone, is that correct?

A That's right.

Q Now, Mr. Yuronka, will you make the same explanation with reference to the ninety-six hundred foot zone on the cross section that you have prepared?

A Getting back to the cross section "AA" Prime, the Amerada State "A" No. 1, had thirty feet of net porosity; State BT "K" No. 1, had twenty-seven feet of porosity; State BT "N" No. 1, had twenty-one feet of porosity; State BT "C" No. 4, did not penetrate that zone, and State BT "C" No. 1, a microlog was not available for the ninety-eight hundred foot zone, and we paid approximately

ten feet from the gamma ray neutron logs. In cross section "BB" Prime, TP State C Account No. 2 Well No. 1, shows twenty-four feet of porosity. At this point, I might add, incidentally, this orange on these cross sections indicate the perforating intervals that are open at the present time in the zones, gas zones, requested by Amerada. We have the zone down here of fourteen feet, 9875-9889, that we originally tried to complete, and after approximately five weeks of production, the oil depleted so it wasn't feasible to continue producing, and we went back and set our packer above our upper zone here. At the present time, we are producing from both zones. Caudle No. 2 shows thirteen feet of porosity; Caudle No. 7, shows thirty-four feet of porosity; Mathers 1-A, shows twenty-nine feet of porosity; Caudle No. 5, twenty-five feet; and BT "I" no. 1, again we estimated that to be twenty-three feet because we did not have a microlog.

Cross section "CC" Prime, BT "K" No. 1, as mentioned before, twenty-seven feet; Caudle No. 7, thirty-four feet; and Mathers A-2, the south offset for the well, asking six hundred and forty acres for, we could not find any porosity at all in the zone. There is some porosity, I might add down here about, somewhere approximately ninety-nine hundred, but we believe that this would be mostly water. In cross section "DD" Prime, State BT "M", has twenty-four feet of porosity, which is about the most in any well in that zone. State BT "N" has twenty-one, Caudle No. 5, twenty-five; And Mathers No. 1, thirteen feet.

Q Mr. Yuronka, referring to TP Exhibit No. 8, will you indicate to the Commission what that is and what it reflects?

A Well, again this is an isopach of the net porosity with a ninety-eight hundred foot pool. Outlined in green is the boundaries, the horizontal limits requested by Amerada for the pool, and outlined in yellow are the proration units that would be alloted each well. Caudle No. 7 again had six hundred and forty acre and Amerada State Shell "A" No. 1, has one hundred sixty, and TP State C Account No. 2 Well No. 1 would also have one hundred sixty.

Q And there were likewise, areas in that particular zone where there is no porosity as far as you have determined from your study?

A Well, as I mentioned, when I explained cross section "CC" Prime, the south offset for Caudle No. 7, with this Mathers A-2, we didn't find any porosity at all and that's in the southwest corner of the requested six hundred and forty acres and just estimating, it would be a little over forty acres there on our isopach that we show no porosity at all.

Q Now, Mr. Yuronka, based upon these cross sections and your isopach, what conclusions are you able to draw with reference to the uniformity of these gas zones or the probability of drainage by one gas well.

A Well, the history of the Bagley Pennsylvanian pool, the oil pool, which is also true in this case, is intervaled in lines of porosity, and in one well you can get production, you can go and perforate the same interval in an offset well and you wouldn't get anything at all.

Q Do you feel that that type of situation lends itself to a large proration unit in one well?

A No. I don't believe a well should have six hundred and forty acres assigned to it.

Q Now, go ahead and sit down. Do you have any information with reference to the bottom hole pressure in the Amerada State well and the TP well to the south of the TP State "C" Well?

A Well, in March 26, 1956, bottom hole pressure was taken on the Amerada State "A" Well and the pressure was thirty-three hundred and seventeen pounds. Bottom hole pressure was also taken on the TP Well and it was twenty-eight hundred and eighty-seven, then in February 15, of 1957, bottom hole pressures were again taken on the well and Amerada's State "A" had thirty-one hundred and seventy and the TP Well has twenty-six hundred and twenty-seven. The approximate shut-in time for our well is what it has been for wells of that depth, which is approximately forty-eight hours and I just presume that Amerada's was approximately the same.

Q What conclusion do you draw or what explanation can you make for the wide variations in the bottom hole pressures in those offset wells in the same gas zones?

A Well, it would seem to me that there is some sort of permability block between the Amerada State Shell "A" Well and the TP Well. Mr. Christie testified, I believe, to the fact that Caudle No. 7, the well Amerada has now completed and had bottom hole pressure in the ninety-eight hundred foot zone of approximately thirty-two hundred and forty. I am not quite sure what it was, but since it is the same zone, and this well is two locations east, and one location south, and the bottom hole pressures were approximately the same, but yet for the TP Well it is five hundred less, and it

would seem there is some sort of permability lock between them.

Q And if such permability block exists or if such porosity variations exists, as had been indicated by your analysis of the cross section, do you believe that in those circumstances, that six hundred and forty acres spacing is proper spacing?

A No, I don't believe it is proper spacing.

Q What is your opinion in so far as the application of Amerada is concerned?

A Well, I believe that the well should be prorated in statewide rules with rateable take.

Q Would that be until such time as additional information--

A Until additional information is obtained. As Mr. Christie testified, they are in the process of trying to complete the well up here in the Southwest Quarter, Southwest Quarter of Section 28, Township 11 South, Range 33 East, and they have filed a location in section 33--

Q And that is in the same section as--same six hundred and forty acre tract, and there is another well of theirs diagonally offsetting it, is that correct?

A Yes.

MR. CAMPBELL: That's all.

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

MR. BUSHNELL: If the Commission pleases, we, Amerada requests a recess for ten minutes to give us an opportunity to look these exhibits over more closely.

MR. PORTER: We will have a ten minute recess.

(RECESS)

MR. PORTER: The meeting will come to order, please.

MR. CAMPBELL: Before we start, I want to offer into evidence Exhibits One through Eight.

MR. PORTER: One through Eight?

MR. CAMPBELL: Yes.

MR. PORTER: Without objection, the exhibits will be admitted. Mr. Bushnell, did you have a question?

MR. BUSHNELL: Yes, sir.

CROSS EXAMINATION

BY MR. BUSHNELL:

Q Mr. Yuronka, am I pronouncing that correctly?

A Yuronka.

Q Yuronka, excuse me. I understand from your testimony that your determinations of these cross sections are made from micrologs, is that correct?

A That's right.

Q However, the exhibits of these cross sections show that they are from electric logs.

A Well, the electric logs were used in the cross sections. However, the micrologs were used to pick the porosity. The part that we show, that I show in these cross sections here--for instance, these little black marks here (indicating), that was picked off the micrologs.

Q You don't have the micrologs here?

A No, sir. I sure haven't.

Q You recognize now, that there can be a difference of opinion as to the correlation of this information on your cross sections,

is that not correct?

A Well, yes, as long as there are two geologists looking at the same cross section.

Q You have pointed out on certain ones of these exhibits, in particular I am referring to the cross sections, to certain wells not showing any porosity at all, is that correct?

A That's right.

Q Now, you will admit, will you not, that although that may be a condition around the well that that doesn't admit to any conditions beyond the well?

A Will you repeat--

Q Although that might be the condition in that particular well, where the well was drilled, you are not testifying that that is, from the fact, that that is the condition beyond that well?

A No.

Q Have you made any study of the samples from the Mathers A-2 Well?

A No, sir, I haven't.

Q On your cross section exhibit, you do not show any porosity in the upper formation in the Mathers A-2, is that correct? Lower, excuse me.

A In the lower. Yes, I do not.

Q Did you make any study of the samples from that formation, from the Mathers A-2?

A I didn't have any samples available.

Q If you found from the samples, in the lower zones in the Mathers A-2, that there was an indication of porosity, would you

accept that?

A Well, I probably would.

Q On the basis of these exhibits, the cross sections, and as you have correlated this information, in the upper eighty-six hundred formation, on the basis of that information alone, would you conclude that it would be economical to drill a well in that formation?

A Economical from what standpoint?

Q Economical to the operator?

A Probably not, depending on what the pipeline would nominate as allowable. Well, may I make this statement? All wells so far that have been completed in both zones, you can not just count the gases, there is also distillate and perhaps, on that basis, it would be a lot more economical to drill a well. I might add that Amerada Shell State "A" No. 1, it produces approximately a little over two thousand MCF's a day and by our last figures of ten cents per MCF and three dollars per barrel of distillate, that's gross income of approximately five hundred and forty-five dollars per day.

Q I asked, excuse me, my question was predicated on the assumption that the conclusion would be reached only on the basis of cross section information that you have here, assuming you had no other information.

A Yes. You--

Q Your testimony is that doubt that it would be economical to drill a well to the eighty-six hundred formation?

A Probably would.

Q Is that correct? Do I understand you correctly?

A Yes, sir. Probably would.

Q Well, in your opinion, would it be economical to drill a well to either formation based on a hundred and sixty acre allowable?

A Well, sir, as erratic as the porosity is, anything is a gamble. Structure doesn't mean much in either zone, in the eighty-six hundred foot zone it is relatively flat and in your ninety-eight hundred foot zone, as depicted on the structure map, it is a little sharp, and of course, as you go on down, the sharper the structure becomes.

Q Mr. Yuronka, you have stated in your testimony that there, that you concluded from these exhibits that there is an indication of a permability block. Do you mean to say that there is a complete block within this area?

A I couldn't testify to that, sir, I couldn't tell.

Q You did not testify to that?

A I couldn't answer that question properly.

Q But you do not testify that there is a complete block?

A There is a block of some sort, I don't know what sort it is. In my opinion there is.

MR. BUSHNELL: That's all the questions I have.

MR. PORTER: Anyone else have a question of Mr. Yuronka? Mr. Cooley.

BY MR. COOLEY:

Q Mr. Yuronka, you made some recommendations in the determinations on your direct examination, and I didn't quite understand.

Do you view the two pools or the two formations, the ninety-eight hundred and the eighty-six hundred, as being two separate sources of common supply?

A Yes.

Q There are presently, while being separate, they are at present within the same pool?

A Yes.

Q The Bagley Pennsylvenian Pool?

A Yes, sir.

Q Is it your recommendation that two pools be created or that they remain together?

A Two pools be created.

Q Two pools. And what was the spacing?

A Well, I recommended that for the time being, it continued under Statewide Rules, with rateable take from all gas wells, depending on any further development, or what may happen with the two wells now in the process of being completed, and also, there is a possibility--we have been talking about going in there and doing some work in our well in the eighty-six hundred foot zone.

Q I take it then, from your recommendation, that the well be produced rateably but you do not propose proration at the present time?

A That's right.

MR. COOLEY: I believe that's all.

MR. PORTER: Mr. Mankin.

BY MR. MANKIN:

Q Mr. Yuronka, the well which you related in the Southwest

Quarter, Southwest Quarter of Section 28, you said there is still some work to be done. Hasn't that been found to be predominantly all productive, do you know?

A Well, they have done an awful lot of work to it, and it seems to me that they were not getting much of anything. I may be wrong, In fact, the last report I got on it, the perforations that were open had been squeezed. What they have done since then, and that was about the beginning of this month, that was approximately two weeks ago, and what has been done since that time, I don't know.

Q I have one more question. Do you have any recommendations as to the limits of the oil pool, which we presently know as the Bagley Pennsylvanian Oil Pool and which has been requested that the vertical limits be withdrawn to include that zone lying between the two proposed gas pools? Do you have any recommendation as to the changing of the limits of that pool, or would you suggest leaving those the same?

A What sort of limits, horizontal or vertical?

Q Horizontal.

A They can remain the same.

Q As far as you are concerned, they can remain the same?

A Yes.

Q The vertical limits, do you agree that the vertical limits should be contracted to eliminate these two gas zones?

A Yes, I believe the main body of the oil pool is from about oh, approximately 8950 to 8400.

Q Do you have knowledge that all wells that are presently

carried in the Bagley Pennsylvanian Gas Pool are in the zone from around 8900 to around 9400 foot, except, with the exception of the Mathers A-2, which has now gone to an oil well?

A No, Mathers No.--

Q Mathers No. 2.

A That's the only well at the moment that is producing from the eighty-six hundred foot pool, and the Caudle No. 7 that Amerada has completed.

Q Then all wells are properly in the zone which they have requested of around 8900 to 9400, which would segregate them from these two gas zones?

A Yes.

MR. MANKIN: That's all.

BY MR. UTZ:

Q Mr. Yuronka, as I understand your testimony, you indicate that there are three zones in the Bagley Pennsylvanian Gas Pool?

A Yes.

Q Do you have any recommendation as to what we should call these zones?

A Pardon?

Q Do you have any recommendation as to what we should call these zones? They are all Pennsylvanian, am I right?

A That's right.

Q Would you call them Upper Pennsylvanian, Middle Pennsylvanian, or Lower Pennsylvanian, Zone, A, B, or C?

A I would just call one Eighty-six Hundred Foot Zone, Gas Zone, and one Ninety-eight Hundred Foot Gas Zone, and then the oil

pool. Well, you can use whatever designation you wish. In Texas in various--you have pools that have various formations that they are producing from and they will call one, for instance, the Goldsmith Field. You've got Goldsmith Field; you've got Goldsmith Fifty-six Hundred; Goldsmith Clear Fork. They have various formations, it is just the depth.

Q That has not been used up to now in New Mexico, has it?

A Well, I don't know, to my knowledge it hasn't, no.

Q Do you not agree that it would be simpler to call them Gas Zone "A", Oil Zone "B", and Gas Zone "C" or something similar to that. I am just fishing for some advice.

A Well, I have given about all the advice I can on the situation.

Q What is your frank opinion of the situation?

A Well, this is just an opinion. The Bagley Pennsylvanian Eighty-six Hundred Foot Gas Pool and Bagley Pennsylvanian Gas Pool and just the Bagley Pennsylvanian Oil Pool.

MR. UTZ: That's all I have.

BY MR. BUSHNELL:

Q Mr. Yuronka, in your opinion, is there enough gas in place in one hundred sixty acres to pay out a well?

A I haven't gone into that. I have done no reservior calculations on this thing at all, Mr. Bushnell.

MR. BUSHNELL: That is all.

MR. CAMPBELL: I have nothing further.

BY MR. PORTER:

Q Mr. Yuronka, you have indicated there can be three separate

pools here. Did you make any recommendations as to what the vertical limits of the two gas pools should be?

A No.

Q Do you have any suggestions?

A Well, I would concur with Amerada.

Q You would concur with Amerada's recommendations?

A That would be it, approximately, yes.

MR. PORTER: Any further questions of Mr. Yuronka? If not, the witness may be excused.

MR. WOODWARD: John Woodward for El Paso Natural Gas Corporation. We have one question of Mr. Yuronka.

MR. PORTER: Go ahead, Mr. Woodward.

BY MR. WOODWARD:

Q El Paso is the only purchaser in the field, is that correct, at the present time?

A Yes, for high pressure gas, yes.

Q You indicated in this case, that you request the Commission to issue an order requiring rateable take and no proration of production, is that correct?

A According to present Statewide Rules, I recommended that it be prorated as such.

Q Are there any Statewide Proration Rules?

A About the only thing I know of is rateable take between offsetting gas wells, and I believe there is a one hundred and sixty acre proration unit.

Q In other words, you are setting up--asking the Commission to issue an order establishing a hundred and sixty acre proration

unit and proration it on an acreage basis?

A Yes.

MR. CAMPBELL: Mr. Woodward, I think you have it a little confused about the legal aspect of this. Perhaps I can clarify that. We have no objection, of course, to an order which defines these pools as separate pools, but we prefer, for the time being at least, to remain on the statewide drilling unit basis, and not to have any proration with gas, but to rely upon the purchaser and the general rateable take provisions of statutes to provide what he is referring to as a proration--

MR. WOODWARD: There is no statewide proration in your--

MR. CAMPBELL: I am not referring to statewide proration, I am referring to taking rateably whether there is proration or not.

MR. WOODWARD: Well, now--

MR. CAMPBELL: In other words, we do not want at this time any proration order issued on the pool. We are satisfied with the present situation so long as the purchaser takes rateably, which they haven't been doing.

MR. WOODWARD: As the purchaser, I will address this question generally to Texas Pacific, its witnesses or attorney. We, of course, want to take rateably, but we are puzzled by how we take rateably in the absence of proration, or in the absence of a standard that we would be forced to adopt ours.

MR. CAMPBELL: Well, aren't you taking gas from some areas where gas is not being prorated at the present time?

MR. WOODWARD: That is true. In accordance with a standard, we must necessarily adopt it either by contract or in an attempt

to comply with the rateable take requirements, but what we are trying to find out here is whether there are any recommendations made as to the basis, or standard, under which we will take rateably.

MR. CAMPBELL: For the time being, we are satisfied with the procedures that we are using where you do not take prorated gas; also, where is the standards you just mentioned, either by contract or by the rateable take provisions that the statute of the department set on acreage basis?

MR. WOODWARD: Of course, we are required under the statute to take rateably in any event without the provision or requirement, but if the special requirement is made to that effect in this particular pool, we would like a standard established by the Commission against which we can make our rateable take. For example, here you have no statewide proration rule or statute which would define the basis. That is, what allowable you would give to the well in order to make a rateable purchase from it. Is it on the basis of one hundred sixty acre proration unit with straight acreage as the formula, or is it on some other basis? If it is the former, and we are required especially by order to purchase on that basis, I think then the pool should be prorated on that basis. If they are concerned with delaying the allocation of each of these intervals, I think we could have a proration unit for the field on that basis, then we would know how to take rateably.

MR. CAMPBELL: Well, Mr. Commissioner, I think that El Paso has been trying to take rateably for years, before proration was ever thought of, on a one hundred sixty acre statewide basis on your contract, and you used the acreage factor only before proration

went in these other pools, but if it would simplify it any, we have no objection to setting up a proration unit of one hundred sixty acres at this time. We don't want a six hundred and forty acre proration unit at this time.

MR. WOODWARD: We are doing it as required by the statutes. We are not doing it under any statewide rule because there is no such thing as a statewide proration unit.

MR. PORTER: Mr. Cooley.

MR. COOLEY: Mr. Woodward, is it your desire that the Commission say what is rateable in these gas pools; have the Commission determine it, is that your desire?

MR. WOODWARD: No, not necessarily. We are willing to undertake to set up some sort of a standard against which we will make a rateable take if that is necessary. But I'll call your attention to provision 65-3-17-E, which provides that any common purchaser taking gas produced from gas wells from a common source of supply, such take rateably, under such rules, regulations, and orders concerning quantities may be promulgated by the Commission consistent with the act. Now we read the rateable take requirement as something we are required to do independent of proration. If the Commission does not proration these pools, we nevertheless attempt to take rateably, and in order to do that, we must establish some standard, which we are willing to do and have done in the past, but if the burden of this recommendation is that we be required to take rateably under the order on any particular standard, that that be spelled out in the order so that we may know if it is a one hundred sixty acre unit allocated on a state acreage basis. That is the

only point that we are making here.

MR. COOLEY: Thank you.

MR. PORTER: Does anyone else have a question of Mr. Yuronka? If not, the witness may be excused.

MR. COOLEY: Mr. Bushnell, in your application, you have requested that proration be instituted in the ninety-eight hundred and eighty-six hundred foot zones in the area under consideration in this case. Possibly I overlooked it or didn't hear it, but I don't believe any reasons have been given why proration should be instituted at this time. Would you like to recall your witness or make a statement to that effect? We would like to hear it.

R. S. CHRISTIE

recalled as a Witness, having been previously sworn testified as follows:

REDIRECT EXAMINATION

BY MR. BUSHNELL:

Q Mr. Christie, would you proceed to answer the question Mr. Cooley asked?

A If I understand the question, our application is asking that the Commission grant us a six hundred and forty acre unit, whether our other units in the field do not have six hundred and forty acres. We will later apply, of course, for a well on a six hundred and forty acre unit. We must have some way to allocate that in the different size units. Is that what you had reference to?

MR. COOLEY: Well, I want to hear your reasons why you think proration should be instituted in the gas pools under consideration here. Your reason you just stated was that in the event that they

have different amounts of acres dedicated to it.

A You must have some way to allocate that production.

MR. COOLEY: Mr. Christie, do you feel that these wells would be discriminated against if a proration unit was not instituted?

A Yes, I do. If no proration or no gas proration unit is established we have a well that we can produce, our Caudle No. 7, and we don't know what size unit to assign to that well unless it would be one hundred and sixty acres, in the absence of any other rules. Obviously, the production from that well would require other developments in order to protect our royalty interests, and that is what we are trying to get away from, because it is not economical to drill new wells and we want to make available the present wells and later on if necessary, re-complete old wells, and we think we can accomplish the purpose and satisfy our royalty owners as well as ourselves by developing this or producing it on a six hundred and forty acre basis.

MR. PORTER: Any other questions of the witness? Mr. Mankin.

BY MR. MANKIN: RECROSS EXAMINATION

Q Going on with the conversation, Mr. Christie, do you indicate that a well in the ninety-eight hundred foot zone would not be economical on one hundred sixty acres?

A If you could only produce the gas under one hundred and sixty acres, no.

Q What is your reaction to a well on one hundred sixty acres for the eighty-six hundred foot?

A The same holds true.

Q Eighty-six hundred is not nearly as attractive as the ninety-eight hundred, is that true?

A That would be my opinion, yes, sir.

MR. MANKIN: That is all.

MR. PORTER: Any further questions? If not, the witness may be excused. Does anyone wish to make a statement?

MR. CAMPBELL: No, sir, too late.

MR. BUSHNELL: No.

MR. PORTER: If there is--

MR. SETH: Shell would like to make a statement. O. L. Seth for Shell Oil Company, and I will read the statement. It is a little bit long.

Shell is interested in the limits that may be established for the Bagley 9800-foot gas zone and in the field rules, if any, that may be promulgated as it is the owner of lease from the state of New Mexico that covers the E-1/2 of the SE-1/4 of Section 33, T-11-S, R-33-E, and completed thereon the first gas well that was completed from the 9800-foot pool. This well, the Shell State 1-A, was completed in November 1951 with an initial potential of 23,000,000 cubic feet of gas per day. The well was shut in until sometime in 1953 waiting for a market. When a market was secured, a 160-acre gas unit consisting of all of the SE-1/4 of Section 33 was created by pooling Shell's lease with that of part of Amerada's Mather Lease covering fee land in the W-1/2 of that quarter section.

As to the limits of the pool, Shell recommends to the Commission that they be fixed not to exceed 1200 to 1300 acres for the following reasons. In the first place, a qualitative anaylsis of

of the drillstem tests made of the 9800-foot zone in the drilling of the wells that have penetrated that zone will disclose that only in a relatively small area, not exceeding two sections in size, were the results of those tests of sufficient size to indicate that the accumulation in the vicinity thereof was commercial. In a great many of the tests gas either failed to reach the surface in measurable quantities or was tested at quantities of less than one million cubic feet per day which would certainly not be commercial for the depth of the pool. We recognize that drillstem tests data are not conclusive but certainly are indicative of what may reasonably be expected for the long pull.

In the second place an engineering analysis involving volumetric and material balance calculations will show that the area of the field cannot exceed 1200 to 1300 acres. The data on which such calculations can be made are in the Commission's files.

It is obvious that the determination of this matter affects the correlative rights of the operators for if non-productive lands are included the rights of some operators are enlarged over what they should be and the rights of the remaining operators are to the same extent diminished. This truth is recognized in the statutes under which this Commission was created in that the Commission is therein especially given the power to determine the limits of pools in connection with its duty to prevent waste and to protect correlative rights. We therefore urge the Commission to confine the limits thereof to that area which is reasonably productive.

The pool limits are a matter of great concern to operators, such as Shell who have only small segregated leaseholds therein.

to other operators, such as Amerada which controls a big part of the land in the pool area as proposed by it, the possible inclusion of non-productive lands is not such a matter of concern. Shell with only its one small 80-acre tract however wishes all barren land excluded.

In connection with Amerada's evidence that the 9800-foot productive formation was found in several wells that were drilled for production from the Devonian Formation, we call the Commission's attention to the fact that the presence of a formation in the space penetrated by a well does not necessarily mean that the formation is productive there; for as we all know formations vary in permeability and porosity and dry spots show up in the middle of a field. Thus Shell's State No. 1-A in which Shell has an interest and which is presently producing from the Bagley 9800-foot zone was dry in the 8690-foot gas formation although it is right in the middle of the area that Amerada is today proposing as the area to be included within the 8600-foot pool.

As to the proposed field rules Shell is opposed to the creation of a 640-acre basic proration unit. The basis of its opposition is that its correlative rights rather than being protected by the creation of such a size unit, will be injured. Where, as here, a pool is small and contains not over 1200 to 1300 acres and the basic proration unit is fixed at 640 acres and one unit is formed in the middle of the pool, as Amerada proposes to do here, it is obvious that those owning under the rim leases will find it very difficult to form a full size unit and that if they do so it will be a most peculiarly shaped one. The shape if formed would be

somewhat like a tire around the inside unit. This would obviously place the rim operators at a tremendous disadvantage. In all probability, under such circumstances, the formation of a unit by the rim leases would prove impossible and the owners thereof would be forced to drill several wells to produce the same amount of gas as the big unit operator could produce from one. This is not right.

Amerada can argue that in this field, since it owns a considerable part of the rim leases, that the Commission should disregard the inequity to them that would result from the establishment of a 640-acre basic proration unit rule. The Commission, however, should take into consideration the correlative rights of every operator regardless of the amount of acreage held in the field. Furthermore, each set of field rules fixes the mold for field rules that will be adopted in the future, and from that viewpoint we should be careful in establishing a precedent that would generally be unfair to rim leases in small pools.

In conclusion, Shell's position is first, that the drillstem test data, if qualitively reviewed, and an analysis involving volumetric and material balance claculations will show that the 9800-foot gas zone does not exceed an area of 1200 to 1300 acres and second, that the establishment of 640-acre proration unit in a small pool is adverse to the correlative rights of the operators therein, especially where all of the central part of the pool is controlled by one operator since it allows that operator to develop his acreage on a pattern that as a practical matter is not available to other operators who as a consequenceare not afforded the opportunity to produce their just and equitable share of the gas on an

equal basis.

Shell therefore recommends to the Commission that it confine the pool to 1200 to 1300 acres. If it does not do so, that it promulgate a rule that all acreage attributable to a well for proration purposes shall be within that distance of the wll that would not exceed the diagonal of a quarter section plus the diagonal of a quarter quarter section, this in order to keep barren acreage in proration units to a minimum; in any event Shell recommends that it limit the size of proration units to either 160 acres or 320 acres. In this connection Shell sees no real reason to depart from the 160-acre basic proration unit heretofore used in the field but believes that the correlative rights of the operators can be protected if a rule providing for 320-acre basic units is promulgated. Proration units larger that 320 acres, however, will definitely adversly affect the correlative rights of Shell and it respectfully and vigorously protest the granting of such.

MR. PORTER: Does anyone else have a statement?

MR. BUSHNELL: Mr. Chairman, I said I didn't care to make one, but after hearing Shell's general statement, I feel complled to make a statement.

I appreciate the fact that the so-called statement contains Shell's attitude, and it contains apparently comments as to some evidence presented here todey. It also, if I recollect correctly, makes certain recommendations. However, it seems to go a little bit further in attempting to present to the Commission, in lieu of the normal procedure, no testimony, it has commented on certain evidence that has not been presented here, and therefore we would

object. Perhaps I shouldn't say object to it in toto, be we do object to any portion of the statement that purports to include information or facts in lieu of any testimony, which they should have put on in that manner, and I have no objection to the Commission having knowledge of any of the information contained in the statement, but I do have to go on record as objecting to its inclusion for any evidentiary purpose.

MR. CAMPBELL: If the Commission please, if it would relieve Mr. Bushnell's fears and concerns, we will adopt it as our statement to go along with the facts we have presented.

MR. BUSHNELL: Thank you. If I heard what I thought I heard, I don't like it. I would like to say one more thing and that is that Shell in its statement, is concerned about the size of this proposed pool, and I think, if you will recollect, that in our testimony we did qualify the delineations as drawn on our exhibits, if I remember correctly, several hours ago, No. 3 and 4. In drawing those lines we did not have full control as to the productive limits, and we had to depend specifically in the western portion on the structure, or what we believed to be the location of the structure. We would have no objection, that's what I am concluding we would have no objection to the Commission reducing the size of that proposed field or pool as to either formation, providing it didn't choose to reduce it to the extent of six hundred and forty acres that we have talked about. That's all.

MR. PORTER: Any further statements?

MR. COOLEY: I take it that you were voicing a general objection, but not one on which you expected a ruling, Mr. Bushnell?

MR. SETH: I think it is a complaint rather than an objection.

Mr. Bushnell: I would say this, that if this case is appealed, I want it to be known on record that I have objected to any attempt of Shell's statement to present information in lieu of of testimony, which should have been presented in the normal manner, and I would hope that on appeal, that that information could not be considered as evidence, that's the purpose for my statement. I am not objecting to its use by the Commission.

MR. COOLEY: Then you are not objecting to it in the record?

MR. BUSHNELL: That's right.

MR. PORTER: Anyone else have anything further in this case? If not, we will take the case under advisement.

STATE OF NEW MEXICO)
: ss
COUNTY OF BERNALILLO)

We, ADA DEARNLEY and J. A. TRUJILLO, Notaries 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 Oil Conservation Commission ofr the State of New Mexico was reported by us in Stenotype and reduced to typewritten transcript by us and that same is a true and correct record to the best of our knowledge, skill and ability.

WITNESS my hand and seal this 26th day of March, 1957.

Ada Dearnley
Notary Public, Court Reporter

J. A. Trujillo
Court Reporter

My Commission Expires:
June 19, 1959.