BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
February 26, 1969
EXAMINER HEARING

IN THE MATTER OF:

Application of El Paso Products Company for special pool rules, San Juan County, New Mexico. Case No. 4053

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

MR. UTZ: Case 4053.

MR. HATCH: Case 4053. Application of El Paso Products Company for special pool rules, San Juan County, New Mexico.

MR. UTZ: I see by the files that you are properly represented by attorneys at law, namely Mr. Charlie Spann.

MR. MASON: My name is John Mason, representing El Paso Products Company. They are represented by local counsel Charles Spann of Grantham, Spann & Sanchez of Albuquerque, who has filed a written appearance. We will have one witness, Mr. M. L. Ayers.

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

(Witness sworn.)

M. L. AYERS

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

DIRECT EXAMINATION

BY MR. MASON:

Q Mr. Ayers, would you please state for the record your name, your place of residence, by whom and in what

capacity you are employed.

A My name is M. L. Ayers, A-y-e-r-s. I am Chief Reservoir Engineer for El Paso Products Company, located in Odessa, Texas.

Q Have you previously testified before this Commission?

A Yes, sir, I have.

Q Your qualifications as a reservoir engineer are a matter of record?

A Yes, sir.

MR. MASON: The qualifications of the witness acceptable?

MR. UTZ: Yes, sir, they are, if he will just spell his name again.

THE WITNESS: A-y-e-r-s.

Q (By Mr. Mason) Now, are you familiar with this application, Mr. Ayers?

A Yes, sir.

Q Would you please state briefly what El Paso is seeking by this application?

A We are requesting eighty acre spacing for oil wells and three hundred twenty acres spacing for gas wells in the Gallegos-Gallup Pool, San Juan County, New Mexico.

Q Mr. Ayers, where is the Gallegos-Gallup Pool located and when was the discovery wells drilled?

A The Gallegos-Gallup Pool is located about fifteen miles south of the town of Farmington, New Mexico in San Juan County. It was discovered by Skelly Oil Company with the completion of the Navajo B No. 1 as a gas well in September, 1954. Navajo B No. 1 is located in the south-east quarter of Section 14, Township 26 north, Range 12 west. The producing formation was a Gallup sand occurring at a depth of about fifty-two hundred feet. The oil zone in this field which was discovered by El Paso Products Company with the completion of the Sullivan F No. 1 in March, 1957. The Sullivan F No. 1 is located in the south-east quarter of the southwest quarter of Section 32, Township 27 north, Range 12 west.

Q That was discovered when, Mr. Ayers, the Sullivan F No. 1?

A In March, 1957.

Q Would you please describe the geology of this pool?

A The Gallup sand in the Gallegos Pool consist of four separate zones of sand development, each separated from

the other by shell streaks. Each zone is a separate stratigraphic trap and has an up-dip gas cap associated with the oil column. Gross thickness of each sand zone is about forty-five feet. The only structure of the field is regional dip and regional dip in this area is to the northeast, about one hundred feet per mile. Porosity in the upper zones averages about four and a half percent. Porosity in the deepest zones averages 8.6 percent. The permeability of the deepest zones averages one and a half millidarcies, while the three upper zones have average permeabilities of less than one half millidarcy.

Q How was this pool developed, Mr. Ayers?

A The development drilling progressed at a rapid rate during the years of 1958 and 1959 and ninety-nine wells were eventually completed in the pool. The map identified as El Paso Exhibit No. 1 shows the ownership, lease names and locations of these wells. Twenty-four wells were completed in the gas cap and the other seventy-five were completed in the oil zone. Most of the oil wells were drilled on eighty-acre spacing and most of the gas wells were drilled on three hundred twenty-acre spacing. The three half sections that are shaded in yellow on Exhibit 1 show the three wells that are presently capable

of producing in excess of the forty-acre gas allowable. Because of the tightness of the producing sands, all wells required hydraulic fracture treatments at completion.

Q Now, would you explain the performance history of this pool?

A The oil wells experienced a drastic decline in all productivity within a first few months of production. The production decline curve identified as El Paso Exhibit No. 2 shows the production history of the Gallegos-Gallup Pool. The same data is shown in tablet form in El Paso Exhibit No. 3. The first sale of gas well gas into a high pressure system which was operated at between four hundred fifty and five hundred pounds began during July, 1958. All other wells were connected to a low pressure system which is operated at twenty pounds and they were connected no later than January 1, 1960, when a no flare order became effective for the fields. The extremely short drop in oil producing rate for this well indicated that the recovery mechanism was extremely inefficient with an ultimate recovery from the oil zone of something like five percent of the original oil in place. Various operators in the field decided to operate under state-wide rules and thereby produced the gas wells at restricted allowables,

based on forty-acre spacing hoping that the expansion of the gas from the gas cap would benefit recovery of the oil from the oil zone.

Q Has this pool ever been unitized for operating purposes?

A Yes, it has. The benefit to this oil zone from the gas cap turned out to be very small and the operators decided to try a pilot waterflood to test the feasibility of the water injection for further improving oil recovery. The field was unitized on February 1, 1963 so that the risk and expense of the pilot waterflood could be shared on an equitable basis. Skelly Oil Company was unit operator. Water injection began in six wells on the double five spot pattern, but water breakthrough in the northeast southwest direction soon caused the injection pattern to be modified to a line drive, which was also oriented in the northeast southwest direction. After injecting a volume of about one million three hundred seventy thousand barrels of water without any oil production increase, the pilot test was considered a failure and the injection of water was discontinued on December 13, 1966. The unit then was dissolved on November 1, 1967, and the leases and wells were

then returned to their original owners.

Q What is the present operating status of this pool, Mr. Ayers?

A During November of 1968, twelve oil wells and fifteen gas wells for a total of twenty-seven wells were still producing from the fields. The remaining seventy-two wells were either inactive or had been plugged and abandoned. The oil zone in this pool is very near depleted but the gas zone has some significant remaining reserves. El Paso Products Company has three gas wells capable of producing in excess of the forty-acre allowable with a two thousand limiting ratio, which under the present method of allowable calculation, grants an allowable of one hundred eighty-eight MCF per day per well. Now, the three wells that we have that are capable of producing in excess of this are the Bell High Taylor No. 4 well, which is located in the southeast of the northeast of Section 17, Township 26 north, Range 11 west; it has a producing capability of about two hundred eighty-one MCF per day. A second well is the Nelson A No. 1 which is located in the southeast of the northwest of Section 9, Township 26 north, Range 12 west. This well has a producing capacity of about four hundred six MCF per

day. Our third well is the Sullivan A No. 1, located in the northwest of the northeast of Section 10, Township 26 north, Range 12 west, and it has a producing capability of about three hundred fifty-four MCF per day. There are no other wells to the best of my knowledge in the field capable of producing a forty-acre allowable or in excess of it.

Q Mr. Ayers, have you prepared any rules or portions thereof which you deem would accomplish the results sought by this hearing, which you would like to propose at this time?

A Yes, sir.

MR. MASON: Mr. Examiner, we have about a page and a half of proposed rules which would accomplish this. Would you like for these to be read into the record or would it be sufficient to offer these in evidence?

MR. UTZ: You might state where you go these rules.

MR. MASON: Okay.

THE WITNESS: There are three other fields in the general area in San Juan and Rio Arriba Counties that also produce from the Gallup formation and have the type rules that we are requesting now. These three fields are

the Angel's Peak, the Devil's Fork, and the Escrito and in each case they have established eighty-acre oil well spacing or eighty-acre proration units for oil wells and three hundred twenty proration units for gas wells and the definition of a gas well being that the well produces a thirty thousand or greater gas-oil ratio is classified as a gas well; anything less than thirty thousand, classified as an oil well.

MR. UTZ: Are you sure about Devils Fork having these rules?

THE WITNESS: The eighty-acre oil well spacing and three twenty-acre gas well spacing, yes, sir.

MR. UTZ: The rules are different aren't they; it's a volumetric pool?

THE WITNESS: Insofar as the method of calculation of allowables is concerned, that's correct, it is different.

MR. UTZ: What you are saying is that some of the rules in the Devils Fork Pool rules are the same as these?

THE WITNESS: Yes, sir. The eighty-acre oil well spacing and the three twenty-acre gas well spacing and the thirty thousand ratio defining a gas well.

MR. UTZ: Are you familiar with the Angels Peak

rules in their entirety?

THE WITNESS: Yes, sir. I have a copy of them with me.

MR. UTZ: Would those rules suffice for this pool?

THE WITNESS: Yes, sir.

Q (By Mr. Mason) The rules that we have proposed certainly are not the complete rules, but we propose that the Commission in its discretion and judgement adopt whatever rules might be necessary for administrative purposes.

Do you have any suggestions to make with respect to the testing of these wells, Mr. Ayers?

A We don't have a specific recommendation due to the extreme lateness in the productive life of the field. We feel like the testing needs to be as elaborate as in the Angel Peak and Devil's Fork and Escrito. As I recall the rules in those three pools require quarterly testing. We don't see that that would serve a useful purpose in the Gallegos. We would suggest either annual or semi-annual. If the testing is annual, we would recommend it be during the summer months; if it's semi-annual, we would recommend it be done in the spring and fall, just for convenience.

Q Would the adoption of these field rules that you have proposed for the Gallegos-Gallup Field that you have requested here today violate the correlative rights of any other producer?

A No, sir, they would not.

Q Is there anything more which you would like to add?

A Well, I would just like to summarize and to impress upon the Commission the advanced stage of depletion of the reservoir. If you refer back to Exhibit 3, you will notice that the cumulative oil production to January 1, 1969, one million four hundred three thousand nine hundred thirty-five barrels and twenty-seven million three hundred eighty-six thousand MCF of gas. Now, I have estimated what I think the remaining reserves are for the entire pool and it would be in the order of one hundred thousand barrels of liquid; in the order of four billion feet of gas. If this is correct, then, the cumulative oil production to date represents 92.5 percent of the ultimate oil recovery and the cumulative gas production to date represents 86.7 precent of the ultimate gas recovery, so there is very little

remaining reserves and what little remains, though, is basically in the gas cap.

MR. MASON: We would like to offer El Paso Exhibits 1 through 3 into the record.

MR. UTZ: Was the map Exhibit 1?

THE WITNESS: Yes, sir. It is so noted in the lower portion.

MR. UTZ: Oh, I see.

MR. MASON: One through four, I'm sorry.

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

(Whereupon, Applicant's Exhibits 1 through 4 were received in evidence.)

CROSS EXAMINATION

BY MR. UTZ:

Q What did you say you calculated the ultimate gas production at?

A The ultimate gas recovery will be about 31.5 billion cubic feet. 27.3 or 27.4 has been produced to date.

Q Now, I have the capacity of your Sullivan No. 1 well. Would you give me the other two?

A Yes, sir. The Dell High Taylor No. 4 is about 281 MCF per day. The Nelson A No. 1, 406 MCF per day, and the Sullivan A was 354. One other thing that I might mention, we still have two wells tied into the high pressure system and, of course, we are hopeful to get them connected over to the low pressure system, but this does require FPC approval and so we have been delayed on that and the Nelson A is one of those wells, so its productivity should be increased above the figure I have cited here today, when we can change it from a 250 pound system to a 20 pound system. The high pressure system was cut in half roughly pressure-wise about two or three years ago.

Q Would your, under your two thousand and one, eighty-acre and three twenty-acre spacing, would your allowable be about three twenty-six a day?

A The allowable for a three twenty --

Q No, it would be a million three hundred four.

A It would be a million three hundred twelve, according to my calculations.

Q Well, we are close. Three twenty-six would be for eighty-acres, right?

A Eighty acres would be six fifty-six. No, I'm sorry, it would one sixty-four barrels of oil per day.

Q Times two thousand?

A Times two thousand would be three hundred twenty-eight.

Q Now, how many other gas wells are active in this pool?

A There is fifteen, I believe. Let me check that number. Yes, sir, there is fifteen gas wells active at this time.

Q How many oil wells?

A Twelve.

Q These gas wells are classified, in your opinion, in accordance with your proposed rules thirty-two thousand?

A Thirty thousand.

Q Thirty thousand?

A Yes, sir.

Q Now, how about the capacity of the other gas wells; how do they compare with yours?

A I can read you each one, if you wish.

Q Well, I am interested in knowing how close these wells might be able to come to producing this kind of an

allowable.

A Well, of course, there is only three that can produce over the forty-acre allowable now and those are ours. I have the -- I took for the last quarter of 1968, the last three months and I attempted to average both the oil production and gas production for every currently producing well in the field and there are no wells, except these three, that can even make a forty-acre allowable, so they are just a bunch of real weak wells. Now, admittedly, we are asking for more allowables than we can produce from any well in the field, but, at the same time, it seemed the only proper approach to the problem. In other words, we considered maybe just having a simpler request for rule change and just go to a higher limiting ratio, but search of the literature indicated that the Commission was kind of reluctant in the past to go to limiting ratios above two thousand and since the wells have been drilled on eighty-acre and three twenty-acre spacing, it seemed more appropriate to go ahead and attack the problem from this fashion. I also discussed this over the telephone with Dan Nutter and this was his recommendation to use this approach.

Q Actually, it don't look like you need any more than an eighty-acre allowable for these gas wells, do you?

A We would prefer to have at least one sixty, I think. For example, I'm not sure how much the Nelson A would be producing when it gets tied into the 20 pound system.

Q Well, the thing you really want is three twenty-acre spacing for your gas well?

A Well, in principal, we think it's right. We admit that there is more allowable there than we can produce, but we can't see any harm in having more allowable than what can be produced. It's just facing the facts of how the wells have been drilled as we see it, but admittedly the only thing we are trying to achieve is to get a higher allowable and, of course, it's certainly a highly deserved increase we feel, because the gas cap has been restricted for eleven or twelve years now.

Q It's your contention that the producing of these wells at full capacity will not harm the future recovery of the oil in the pool?

A It certainly is. Over three-fourths of the oil wells have been plugged, so I don't see how there could possibly be any danger of any harm.

Q Is the oil coming from the same zone? As I recall in the past, seems like we had three stacked pools here actually?

A Four.

Q Four zones?

A Yes, sir.

Q And the GOR's were somewhat different in each zone, were they not?

A We feel like all four reservoirs were separate, but they were similar in many respects. Each had its own column and each had its associated gas cap and in each case the acre feet of volume were spaced between the gas cap and the oil zone; it was just about the same, about one to one ratio. Of course, the three upper ones were not as productive as the deepest zones; the deepest zone had the higher porosity and the higher permeability and so, therefore, they performed better, but in many respects, other than that, they were basically the same.

Q Each well has been completed in all zones?

A Not necessarily. You can find many cases where the wells were just perforated in the lower zone only because it was the better zone. You can find many cases where all four zones were perforated or you can find other cases where

just two zones were perforated, but it was all considered one common source of supply, of course, all Gallup age. If more than one zone was perforated, it was commingled in the well bore so it would be impossible to say how the performance has varied between the zones. We do not have the data to interpret that.

Q With the failure of the waterflood pilot project, the probability of getting ninety-two and a half percent of the oil out of this pool is probably pretty remote?

A I think you misunderstood me when I cited that figure. I meant to infer that of all of the ultimate recovery that could be obtained from the field, ninety-two percent had been obtained now. Ultimate recovery is going to represent 5.1 or 5.15 percent of the original oil in place, but the stage of depletion to get this ultimate recovery oil-wise exceeds ninety-two percent and exceeds eighty-six percent for gas.

Q What you are saying is you got ninety-two and a half percent of all you are going to get out?

A When we get it all out there is still going to be ninety-five percent of it down there. Performance-wise, this is the poorest recovery of any reservoir I have ever

studied, but we are comforted a little bit by thinking that we are giving it every possible chance to do better by restricting the gas cap and by trying pilot water. We see no chance of doing anything now to further recover.

Q Are there any other questions of the witness?

Now, in order to classify these wells at the present time, is it your suggestion to immediately take a GOR test or take the last available GOR test? What is the last available GOR test?

A I'm not certain. I think that the testing has been on an annual basis and I would assume the last GOR test would have been last summer and it probably would be well to take new ones at this time, at least for the wells that would be affected by the change in rules, and certainly, again, we think that you should also have the right to retest a well if there is a need for it and when we get the Nelson A tied into the lower pressure system, that well should be retested at that time, I would think. We would be glad to do any testing, you know, within reason on the three wells that are concerned with this problem. We just didn't want to, in general terms of the rules, put a burden on all these other wells that are stripper stage of production test-wise.

Q All producing gas wells will have to be tested to be classified, won't they?

A I don't know. I'm not that familiar with the Commission procedure.

Q It's pretty hard not to, I would say. Would you think thirty days would be enough time to test all the wells for classification purposes?

A Yes, sir, I would think so.

MR. UTZ: As a matter of interest, I looked at the November production for this pool and I had twelve wells over thirty thousand producing GOR.

Are there any questions of the witness? The witness may be excused. Do you have another --

MR. MASON: No, this completes our case. Thank you.

MR. UTZ: Statements in this case? The case will be taken under advisement.

I N D E X

E X H I B I T S

EXHIBIT	MARKED	OFFERED AND ADMITTED
Applicant's 1 through 4	2	13

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

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

Glenda Burks
Court Reporter

I do hereby certify that the foregoing is a complete record of the proceedings in the examiner hearing of Case No. 4053 heard by me on Feb. 26, 1965.

Examiner
New Mexico Oil Conservation Commission