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

June 10, 1964
EXAMINER HEARING

IN THE MATTER OF:

Application of Continental Oil Company for a pressure maintenance project and a dual completion, San Juan County, New Mexico

Case No. 3069

BEFORE:

Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

MR. NUTTER: We will call Case No. 3069.

MR. KELLAHIN: I am Jason Kellahin of Kellahin and Fox, Santa Fe, New Mexico appearing in association with Mr. W. M. Griffith, a member of the Colorado Bar who will present the case on behalf of Amerada.

MR. GRIFFITH: I only have one witness, Mr. Nutter.

Could I have him sworn at this time, please?

MR. DURRETT: Would you stand and be sworn, please?

(Witness sworn.)

* * *

F R E D V A N M A T R E, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. GRIFFITH:

Q Would you please state your full name, and you might spell it, and your address?

A Fred Van Matre, the last name is spelled V-a-n M-a-t-r-e. I live in Durango, Colorado.

Q By whom are you employed and in what capacity?

A I am employed by Continental Oil Company as a District Engineer in our district office, production office in Durango, Colorado.

Q Have you previously testified before the New Mexico Oil Conservation Commission as an expert witness in Petroleum Engineering?

A Yes, sir.

MR. GRIFFITH: Will the Commission accept the qualifications of Mr. Van Matre as an expert witness?

MR. NUTTER: Yes, sir, please proceed.

Q (By Mr. Griffith) Have you prepared an Exhibit showing

the Pennsylvanian CD Zone of the Rattlesnake Field?

A Yes, I have.

Q I have marked this Exhibit "Continental Oil Exhibit Number "A". Was this Exhibit prepared by you or under your supervision?

A Yes, it was.

Q Would you explain what Exhibit "A" shows?

A Exhibit "A" is a Lease Plat of the Rattlesnake Field. It shows oil wells that have penetrated the Pennsylvanian CD Zone. It also depicts the acreage ownership within a radius of two miles of the proposed injection wells Number 140 and 146 shown on this Lease Plat in the hashed area of, for instance, like in Section 1 and 6 and 31 and 36, depicts Continental's original Lease, and on the west side of this Plat, for instance, Section 11 extending into Section 2 on down into Section 14 depicts what we call tract 16 and 17 that was acreage that was recently acquired by Continental.

Q Now, for example, in Section 11, all of Section 11 is under lease to Continental?

A Yes, sir.

Q And those two different leases that Continental has --

A The old leases and the new leases.

Q What does Continental propose to do in this?

A Continental wishes to, by injecting water into the

Pennsylvanian CD Oil Zone into wells Number 140 and 146, to maintain the reservoir pressure.

Q Have you made any studies; when I say you, I mean Continental Oil Company, have you made any studies of pressure maintenance in this reservoir?

A Yes, we have prepared a pressure maintenance study of the reservoir. We have observed that the pressure has been declining at a very rapid rate, and with the injection of water, this pressure decline can be arrested and the whole recovery can be increased.

Q Could you expand on your statement that there has been a considerable drop in reservoir pressure?

A Yes, in Section 2 and in Section 1, you will notice wells 17, 24 and 100, these wells were drilled in the early 1920's and were produced from the Pennsylvanian CD Zone until 1940. At the time these wells were completed the original bottom hole pressure was 3400 pounds. In 1940 these wells were shutin. In 1960 Continental continued development of the field initially drilling Number 136 at the time. This well was completed, the bottom hole pressure was 1600 pounds. We continued development of the reservoir and have observed the pressure performance since that time, and the pressure is now rapidly decreasing from the 1600 pounds in 1960 down to the current pressure, in the field.

MR. NUTTER: That field is average?

A Yes, sir.

Q (By Mr. Griffith) What is the producing mechanism in the reservoir?

A The primary producing mechanism has been solution gas drive.

Q So this has caused --

A This is caused through this type mechanism. The pressure is expected to go down quite rapidly. We have experienced very rapid decreases in the oil producing rate. For instance, in 1962 your weight was 700 barrels a day and we were currently producing about 200 barrels of oil per day.

Q Have the boundaries of this reservoir been determined?

A Yes, sir, the boundaries have been defined. For instance, in Section 1, Continental drilled one Number 135 in the northeast of the northeast of Section 1. This well tested water in the Pennsylvanian CD Zone and was abandoned. We drilled Well Number 145 which is located in the southeast of the southwest of Section 12. We attempted a completion in the Pennsylvanian CD Zone. However, the Zone was very thin and had very little permeability and produced a small amount of water. We later drilled one Number 147 located in the southwest of the southeast of Section 13. We attempted a completion in the Pennsylvanian CD Zone in this well; however,

it was tight and we produced a small amount of water.

The well is currently shut in. The current well located in the northwest of the northeast of Section 20, we drilled that well to test the Pennsylvanian CD Zone, also. The zone produced water at that location.

On the west side of the reservoir in Well Number 44 located in the southeast of the southwest of Section 2, pressure built up. Surveys were conducted in that well. It was determined from the pressure build up surveys, we had a boundary or permeability pinchout, the reason we closed the well. Also, you will note in the northeast of the northeast of Section 3, the Humble Dry holes were tested, the Pennsylvanian CD Zone, and it also is non productive.

Q So this is the boundary in this reservoir?

A Yes, sir.

Q And has New Mexico Oil Commission granted Continental Oil Company permission to dispose of this salt water in this field?

A Yes, they have; and in August of 1962 the Commission granted Continental permission to inject water into the Organ Rock formation in Well Number 145. Continental laid a line from our main battery installation, which is located just south of Well Number 139 in the southeast of the southeast of --

Q If I can interrupt here, he marked on Exhibit "A"

where this battery is located; please continue.

A We installed the line from the battery down to Well Number 145 and installed the salt water disposal pump in the salt water tank.

Also, I might mention that all of the production from the existing producing wells go to this one central facility where all of the water is gathered in Number 145.

Q What is the present and total amount of water that has been disposed of in Well Number 145?

A To the first of May of this year, we have injected 115,000 barrels into the Organ Rock in Number 145, and at the present time we are injecting 250 barrels of water per day.

Q I believe you indicated earlier that you plan to use Well Number 140 initially as the injection well and then perhaps Well 146 subsequently. Have you prepared an Exhibit showing the completion of these two wells?

A Yes, I have.

Q That is Continental's Exhibit "B". Was Exhibit "B" prepared by you or under your direct supervision?

A Yes, it was.

Q Will you explain what Exhibit "B" shows starting with Well Number 140?

A On Exhibit "B" we have a schematic diagram of the proposed injection set up for Well Number 140. We would set a

model "R" packer approximately 6600 feet and inject through 2 and 7 inch tubing.

Q Did you receive a letter from the State Engineer inquiring as to the use of tubing in this injection well?

A Yes, we had a letter from the State Engineer indicating that our original application did not indicate that we would inject through tubing in this well; however, we do inject through tubing with the packer in the hole.

Q And I believe the original application didn't indicate tubing?

A That is correct, no tubing was indicated.

Q But our Exhibit "B" correctly shows the correct completion?

A That's correct.

Q Are the perforations limited to the Pennsylvanian CD Zone in Well Number 140?

A Yes, they are. The perforations as indicated in 6658, 6680 and 6700, and 6710, all within the oil zone.

Q What does Exhibit "B" show in relation to well 146?

A On Well Number 146 we began showing the proposed installation for injection on this particular well. We would inject through tubing with a model "R" packer set at approximately 6500 feet. We would inject into the open hole section of the Pennsylvanian CD. Also, we would produce the Pennsylvanian

"B" gas on through the tubing casing annulus.

Q Now, at the present time you plan to start injecting into Well Number 140, and if the results are satisfactory, then inject into Well Number 146?

A Yes, we plan to go to Number 140 first and observe the performance, and go to Well 146.

Q What is the source of the proposed injection water?

A We propose to utilize three sources of water. One would be the Pennsylvanian CD salt water which is being produced at this time. We would also use water from the Organ Rock formation in Well Number 145 and we propose to perforate the Dechelle formation.

Q And where is the well that would produce --

A Well Number 145, the current salt water disposal well.

MR. NUTTER: And that is the Zone --

A That is the Organ Rock open in that well now, sir, and we would leave the Organ Rock open and produce the water we have injected, back out.

Q And also perforate?

A Perforate the Dechelle.

Q So you have two zones producing from that well, then?

A Yes, sir.

Q Do you have any other source of water that you plan to use?

A Yes, in the event that a sufficient supply cannot be developed in Well Number 145 we propose to install a line from the central battery to Well Number 100 located there in Section 2. Well Number 100 is presently completed in the Dechelle and will flow about 1900 barrels of water per day.

Q Are all three of these waters salty-type waters?

A Yes, they are.

Q What is the anticipated volume of water that will be injected into the formation?

A We propose to inject 3,000 barrels of water per day.

Q If the Commission approves this Application, what will the results be, in your opinion, of the pressure maintenance program?

A Our analysis, the reservoir, performance with the pressure maintenance as indicated, we can arrest the rapid pressure decline. We should be able to produce at the oil producing rate, and the ultimate recovery can be increased.

Q And in your opinion, is it in the best interest of conservation to arrest the pressure decline and to conserve the reservoir energy?

A Yes, it is.

MR. GRIFFITH: We have no further questions.

MR. NUTTER: Are there any questions of the witness?

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Van Matre, this Number 146 will be a dual completion; is that correct?

A Yes, we would propose to set that up like shown on our Exhibit "B" there.

Q With the gas going up the annulus?

A Yes, sir.

Q Now, you stated that your original letter to the State Engineer did not indicate to use tubing in the Number 140?

A Yes, sir, our Application didn't show tubing, but we plan to install the tubing and packer.

Q So, then, after his letter of May 12, when he said he would offer no objection to the approval of the Number 140 for an injection well, or the conversion of Number 140 to the injection, if the injection was through tubing, then you went ahead and drew this schematic diagram, and presumably this would meet his requirements, then?

A Yes, I believe so.

Q You haven't had any further study with him on the subject?

A No, sir, I haven't.

Q Now, as I understand, after the first three wells had been produced for twenty years or so they were shutin, and the Number 136 was drilled in 1960 and had a pressure of 1600 pounds?

A 1600 pounds.

Q And now the average pressure is about 700?

A 700 pounds.

Q Now, is it your thought a pressure maintenance project order for this area would be similiar to the project orders that have been issued for other projects in the northwest that contain the provision for water credit for high gor's or is the gas oil ratio any problem?

A With any pressure it should start on down, so I don't anticipate a problem there.

Q So, in that portion of the rules that are normally written for these projects in the San Juan Basin, you would have to have TS rubing and all of that, and we don't have that letter here today, but you don't feel that that portion of the normal order is necessary in this case?

A No, sir, I don't believe so in this case.

Q The gas has never been any problem?

A No, sir, we have never exceeded the gas oil ratio.

Q Now, you stated that your initial injection would be 3,000 barrels per day?

A Yes, sir, that is --

Q That is assuming the use of both wells?

A No, sir, we would like to inject the 3,000 barrels of water a day into Well Number 140; however, Well Number 140 may

not accept this volume, and if not, we would convert Well Number 146 right away, also.

Q Your 3,000 would be whether it took one well or two wells?

A Yes, sir, this would offset our present reservoir rate by 1,000 barrels a day.

MR. NUTTER: Are there any further questions of Mr. Van Matre?

MR. DURRETT: I have a couple of questions.

CROSS EXAMINATION

BY MR. DURRETT:

Q Am I correct that you are requesting rules that are similar to previous pressure maintenance rules, that we have written, special rules including provisions for transfer of allowables and all of the miscellaneous provisions in those rules with the exception of gas oil ratio provisions; is that correct?

A Yes, sir, we would like to have the transfer allowable, and I can see no problem. We are exceeding the gas oil limitation that exists.

Q So you would think, at least at this time, you would like the rules similar to previous rules?

A Yes, sir.

Q Now, I am wondering about the provision that we have

put in prior rules, special rules for pressure maintenance projects concerning wells directly or diagonally outside of the project area. Are the reserves more than a certain amount of allowable? Do you have any thoughts along that line, are you going to have that problem?

A I don't believe we will have that problem. Our present allowable is, of course, 194 barrels per day per well, and in my opinion it will never exceed this rate in any one well.

MR. NUTTER: There aren't any offset operators?

A No, sir.

Q (By Mr. Durrett) That wouldn't be a problem in your case, at all?

A No.

MR. DURRETT: I think that's all.

MR. NUTTER: Are there any further questions of Mr. Van Matre? You may be excused.

MR. GRIFFITH: I request the Commission to accept Exhibits "A" and "B" into evidence.

MR. NUTTER: Continental's Exhibits "A" and "B" will be admitted into evidence.

Do you have anything further, Mr. Griffith?

MR. GRIFFITH: I do not.

MR. NUTTER: Does anyone have anything they wish to

offer in Case 3069?

We will take the case under advisement, and the Hearing is adjourned until 1:30.

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STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

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

Witness my Hand and Seal this day of , 1964.

Charles Floyd Walker
NOTARY PUBLIC

My Commission Expires:
March 25, 1968.

I N D E X

E X H I B I T S

Number	Marked for Identification	Offered	Received
"A"	3	14	14
"B"	7	14	14

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3069, heard by me on June 10, 1964.

New Mexico Oil Conservation Commission, Examiner