STATE OF NEW MEXICO
ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BLDG.
SANTA FE, NEW MEXICO

18 November 1986

EXAMINER'S HEARING

IN THE MATTER OF:
Application of Tenneco Oil Company for compulsory pooling, San Juan County, New Mexico. CASE 9265

BEFORE: David R. Catanach, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

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I N D E X

E X H I B I T S

MR. CATANACH: Call next Case 9265.

MR. TAYLOR: The application of Tenneco Oil Company for compulsory pooling, San Juan County, New Mexico.

MR. CATANACH: Are there appearances in this case?

MR. KELLAHIN: If the Examiner please, I'm Tom Kellahin of Santa Fe, New Mexico, the law firm of Kellahin, Kellahin & Aubrey. I'm appearing on behalf of Tenneco Oil Company, and I have three witnesses, three very good witnesses.

MR. CATANACH: Okay. Will the witnesses please stand and be sworn in at this time.

(Witnesses sworn.)

MR. CATANACH: I'm sorry, was there any other appearances in this case?

MR. KELLAHIN: Mr. Examiner, this case is one in a continuing series of cases that Tenneco has filed applications for and received orders approving operations in the City of Farmington.

This originally involved a

drilling island in the City of Farmington in which Dakota wells were drilled from a drilling island to develop an entire section.

The original two wells have been drilled, completed, and this represents the third well.

The reason we're requesting a compulsory pooling order for the third well is this represents and infill well. There was concern on our part that the original forced pooling order on the initial well in the east half of this section would either have to be amended or a new forced pooling order entered in order to cover the infill well.

The three witnesses today are the same three that appeared before you last year in the original hearing. They can discuss for you the efforts they have made to acquire additional leases from various parties, notwithstanding the fact that those parties, some of which are already pooled in the original well.

We have brought back the same geologist to talk about the geology, what has occurred, the knowledge he's gained from the second wells drilled, and then, finally, the third witness is the engineering witness who studied the production and can talk about the risk factor, the costs of drilling, and the inherent risks involved in drilling from the island.

KEVIN G. HERINGER,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Heringer, for the record would you please state your name and occupation?

A Kevin G. Heringer, petroleum landman for Tenneco Oil Company, Denver, Colorado.

Q Mr. Heringer, have you previously testified before the Oil Conservation Division?

A Yes, I have.

Q And were the petroleum landman that testified in the original forced pooling case involving the initial well in the east half of Section 10, Township 25 -- 29 North, Range 13 West?

A Yes, that is correct.

Q And subsequest to that pooling order have you continued to make efforts to obtain leases from various mineral interest owners in the east half of Section 10?

A Yes, sir.

Q For the drilling of this infill well?

A Yes, we have.

MR. KELLAHIN: We tender Mr. Heringer as an expert petroleum landman.

MR. CATANACH: He is so qualified.

Q Mr. Heringer, let me direct your attention to the Tenneco exhibit booklet and if you'll move past the first page and look at the second page in which you have provided us a summary of the acreage and then identified for us in the east half of the section the various percentage ownerships.

Would you take a moment and outline for the Examiner what is the status of the various ownerships?

A Okay. The page sets out at the top, we had started back in May of 1984 knocking on doors, making an attempt to lease the mineral owners within the east half of Section 10.

To date Tenneco has taken over 420 leases from mineral owners.

Running down the ownership, starting at the top, Tenneco Oil Company, we've leased 278 acres, roughly 87 percent of the spacing unit.

(Not understood) Associates, who leased approximately 20 acres, 6.27 percent; a few additional parties that have agreed to participate, a little over a half of 1 percent; and the acreage that we've been unable to come

to terms or reach people on is 20 acres, or 6.263 percent; to total 100 percent of our spacing unit.

Q This represents the status of your efforts as of what particular time?

A As of the -- probably about a week ago. Well, we're still making an effort to contact people and in the event people -- this number changes, has changed daily within the last month, and we feel as though these are the -- the final numbers that we've come to.

Q We have additional parties that have agreed to participate in the infill well as a result of your efforts that were not participants in the original well. In other words, they were nonconsenting owners in the original well.

A We don't have any parties that have agreed to participate but the people we have force -- the people that we force pooled first time around, through our notices have come back and decided to lease to us, approximately 20 people, so it's --

Q Describe for the Examiner how you have decided or elected to handle that particular interest ownership.

A We told the people that we would go back, date our leases prior to when the well was spud, the initial well, take them off the forced pooling, give them the same

compensation that we'd offered up front, and pay them a 3/16th royalty.

Q When we address ourselves now to those individuals and interests that as of a few weeks ago were not committed to the infill well in the east half of this section, how have you identified those people?

A Excuse me, can you --

Q Yeah, have you made a list of them?

A Yes. Okay. Looking at Exhibit Two, it is a map of the parties that we had been unable to come to terms with or reach.

Now on Exhibit A attached to that map is a listing of all the parties that we are force pooling here today.

Q All right. How -- how do we read the map and the color code in yellow with the numbers and integrate that with the tabulation of names on Exhibit Number Three?

A Okay. Just your -- your numbers correlate with your tract numbers on Exhibit A.

Q On the far left margin of Exhibit A, which I've identified as Exhibit Three for this hearing, is a tract number --

A That's correct.

Q -- and that corresponds, then, to the tract identified on Exhibit Two, the plat, and shows you

what area in yellow, then, that party has an interest.

A That's correct.

Q Okay. Within each of those tracts, then, have you set forth a column to show what their net acres is for the entire 320-acre unit?

A Yes. That is also on Exhibit A. It shows the net acres and in addition to that is their percentage within the east half spacing unit, and the last column is abbreviated, that's "contacted", whether or not I've contacted the people through certified mail.

Q When we look at the names on that list, I believe there are 26?

A That's correct.

Q Okay. Most of the names are listed with addresses unknown. Are there any parties on this list with whom you have made actual contact?

A Yes, sir. There are two parties, Tract No. 20, Dr. Quintana and Moreland in Farmington do not want to do anything with Tenneco.

And Tract No. 25 is a widow in Farmington, Edna Weinig. She's in the same position as Moreland and Quintana.

Q You have made both Mr. Quintana and Dr. Moreland and Mrs. Weinig offers of lease, using the same offers and terms you have made to others?

A That's correct.

Q Okay.

A We've also offered them participate or farm out to Tenneco.

Q And their responses have been what?

A Don't want to talk to Tenneco at this time.

Q Okay. With regard to those for which you do not have any contact, would you identify the efforts that Tenneco has made in order to find current addresses for any of those individuals?

A This has been going on for over three and a half years and many of these people have never been -- had started out trying to be contacted; had a broker down in Farmington for over a year and a half attempting to locate these people.

Just within the last month and a half we made another run in trying to track these people down again; hired another broker, and still knocking on doors, looking in (not clearly understood) office see if taxes have been paid, phone books, written letters to them, just about all, all avenues have been explored.

Q Are you aware of any other reasonable effort that might be undertaken by Tenneco in order to establish the addresses for any of these remaining individuals?

A Not at this time.

Q Let's turn to Exhibit Number Four. Would you identify that for me?

A This is a letter that was mailed out certified to the parties stating that the forced pooling was scheduled for November 18th and they could appear if they so elected.

Q This is the type of letter that Dr. Quintana would have received a copy of?

A That's correct.

Q All right. Attached to that exhibit is a copy of the cover letter and the application, the actual application was sent to those two individuals owning interests in Tracts 20 and 25?

A That's correct.

Q Okay.

A In addition, I'd like to point out on Exhibit A to that, to this letter, is the fact that a number of parties have agreed to lease to Tenneco between the time that this letter was mailed out and this hearing.

They are not included on the forced pooled acreage.

Q If the Examiner desires, then, he can compare the attachment to the letter with the Exhibit Number Three and see which parties, then, have voluntarily commit-

ted either by lease or participation.

A That's correct.

Q Okay. Let's turn to Exhibit Number Five and have you identify what that is.

A Exhibit Number Five was the letter that we mailed out prior to informing individuals that if we could not come to terms that we would force pool them. It sets out what we did drilling our first well, we're coming back drilling an infill well, and then it sets out their options of leasing, farming out, or participating, and the fact that if we cannot come to terms with them, we'll be forced to seek compulsory pooling.

Q And a similar type letter was sent to the interest owners in Tract 20?

A That's correct.

Q Okay. When we turn to Exhibit Six, would you identify that for us, Mr. Heringer?

A That is the well cost estimates for drilling this well and that was enclosed with our letter of October 23rd, setting out the cost that people would have in drilling this well.

MR. KELLAHIN: Mr. Examiner, each of our two subsequent witnesses will address the well cost question.

Q Would you identify Exhibit Number Seven

for us?

A Exhibit Seven is the COPAS accounting procedures that will be attached to these wells.

Q When we turn to the COPAS accounting procedures, let's turn to the third page and have you identify for us the overhead rates.

A A drilling well rate of $4000; a producing well rate of $400.

Q Are these the producing and drilling rates that you propose the Examiner include in a forced pooling order?

A Yes, sir.

Q And how do they compare to the overhead rates that were used by Tenneco in the initial wells in this section for the Dakota production?

A They are identical.

Q Exhibit Number Eight, would you identify that exhibit for us, Mr. Heringer?

A Exhibit Eight is shown as a special use permit issued by the City of Farmington, just merely to show that we're working with the city and have come to terms with them on drilling these wells within the city limits.

Q Is this special use permit from the City of Farmington still in full force and effect?

A Yes, it is.

Q And this is the use permit by which you will drill the infill well?

A That is correct.

Q Would you identify Exhibit Nine for us?

A Exhibit Nine is our directional drilling order from the State saying that we have authority to directionally drill to the northeast quarter of Section 10.

Q Attached as an exhibit to that order is the surface and approximate bottom hole location of each of the four wells. Identify for us which of the four wells we're dealing with here.

A Which of the --

Q Which of the four wells identified on Exhibit A is the one that addresses the well today.

A Okay. The City of Farmington Well No. 1-E.

Q All right. As best you know, is the surface location and the approximate bottom hole location still the same for that well?

A Yes, they are.

MR. KELLAHIN; That concludes my examination of Mr. Heringer.

We would at this time, Mr. Examiner, move the introduction of Tenneco Exhibits One through Nine.

MR. CATANACH: Exhibits One through Nine will be admitted into evidence.

CROSS EXAMINATION

BY MR. CATANACH:

Q Mr. Heringer, have you had any more luck in finding any of the people that you -- hold on a second -- the people listed on Exhibit A to Exhibit Number Three, you still can't find the majority of those people.

A That is correct.

Q You couldn't find those initially, either, when you drilled the first well.

A That's correct.

Q Have you -- you've been continuing your attempts to locate those people?

A It's -- we have. I think we've explored, you know, all our avenues to locate these people and a number of these, I would guess, are people that are -- people that have passed away, and -- but the effort is on-going and if any of these people do appear, we will try to reach terms with them.

Q Okay, as I understand it, you've offer to allow the nonconsenting interest owners in the first well, you're offering to let them join in the second well and go back and join in the first well? Is that what you said?

A Well, what we're doing is we've said that if they want to lease to Tenneco, we will predate the lease to Novembr of last year and take them off of forced pooling and pay them the bonus $400 an acre, and then wipe them off, I guess, wipe them off the forced pooling as if they'd leased to us from the outset.

Q Okay, and you've had some success with that?

A Yes, we have. Within the last ten days I've picked up another seven or eight mineral owners that have agreed to do that.

Q Okay.

MR. CATANACH: I think that's all I have at this time.

The witness may be excused.

MR. KELLAHIN: Call Mr. Mike Decker at this time, Mr. Examiner.

MICHAEL DECKER,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Decker, would you please state your

full name and by whom you're employed and in what capacity?

A My name is Michael Decker. I'm a project geological engineer for Tenneco Oil Company in Denver.

Q Mr. Decker, have you previously testified as a petroleum geologist before the Oil Conservation Division?

A Yes, I have.

Q In fact you testified before the Examiner at a hearing held last year in which Tenneco obtained approval not only for the forced pooling orders but in the directional drilling portion of those applications.

A That is correct.

Q Subsequent to your past testimony before the Division, have you made further geologic investigations of this area?

A Yes, I have.

Q And do you have recommendations to the Examiner as to a risk factor penalty to be assessed in this case?

A Uh-huh.

Q And have you made a review of the well costs that were involved in drilling the initial two wells and how they compare to the infill well?

A Yes.

MR. KELLAHIN: We tender Mr.

Decker as an expert petroleum geologist.

MR. CATANACH: He is so qualified.

Q Mr. Decker, let me direct your attention to Exhibit Number Ten in the exhibit book and have you take a moment and simply identify the exhibit.

A Exhibit Number Ten is a net pay Isopach on the Dakota B-1 Sand. The contour interval on this Isopach is 4 feet and it also includes location of the subject well and a cross section that is on -- that is Exhibit Number Eleven.

Q Find for us on the plat Section 10 that is the subject of this hearing.

A The Section 10 is located in the middle of the diagram and includes the surface location of the island, which is located in the City of Farmington, and is -- there is the directional diagram to the bottom hole location of the 1-E shown within Section Ten.

Q And to the south of the surface location is the bottom hole location of the No. 1 Well?

A That is correct.

Q And then to the southwest is the bottom hole location of the No. 2 Well?

A That is correct.

Q In drilling the initial two wells, the

No. 2 and the No. 1, what did you discover in terms of the net pay thickness in the Dakota B-1 Sand?

A Okay, in the No. 1 Well the net pay came in -- within the Dakota B-1 Sand, came in as we had interpreted it; however, then we drilled the No. 2 as we continued to step out towards the west, we did not encounter as much pay as we had expected, and the 16 feet that we encountered does reflect a poorer well, whereas the net pay Isopach numbers do reflect the estimated ultimate recovery of the well.

Q In comparing the quality of the No. 1 with the No. 2 Well, and the difference of 8 net feet between 24 and 16, what significance, if any, does that difference make?

A It does make a significant difference and I'd like to defer what the estimated ultimate recovery is to Tim Howar, but it does make a difference in the production rates and also in the final recovery.

Q In assessing the geologic risk involved in picking the location, then, for the infill Well 1-E, how critical is it for you to find a location that has a net footage thickness greater than the 16 feet you found in the No. 2 Well?

A It is significant because we have determined that the 16 feet is close to our economic limit

of drilling a directional well in this area and so it is crucial that we do obtain greater than 16 feet and, hopefully, again about 20 feet, as we did in the No. 1 Well.

Q Can you assign a percentage risk factor penalty to be assessed in your opinion to the noncensenting working interest owners based upon the geologic risk?

A Yes, I believe that's a 300 percent penalty is adequate.

Q And by 300 percent you mean recovering the costs of their share of the well from production plus two more times?

A That is correct.

Q Let's talk about the risk involved inherently in drilling a directional well, as you've experienced that risk in Section 10.

Describe for the Examiner what was your success and what difficulty you may have encountered in drilling the first two wells.

A Okay. When we drilled the first two wells, the No. 1 and No. 2, and I will address my comments primarily to the No. 2 because the No. 2 is similar in angle as to the 1-E that we will be drilling.

We kicked off the well in the Kirtland Fruitland undivided interval and (unclear) to build the angle through the Mesaverde formation and through the Point

Lookout member. We got up to approximately 29 degrees within the Point Lookout. Our angle, our proposed angle was 28 degrees. Once we passed through the Point Lookout into the Mancos formation, which is located immediately below the Point Lookout, we began to have hole maintaining our angle. We dropped to 11 degrees within, I'm doing this from memory here, about 600 feet.

We kept going in with additional downhole motors to alleviate our angle dropping. We found that just by going in with a standard bottom hole assembly made up to keep the angle built, that was not sufficient. So we had to keep going in with downhole motors. We had to make those additional trips that added to our days, the total days of driling, and also to, substantially to our trouble time and cost, in just keeping the angle built so we'd be able to hit our target that we had said we would hit within our directional drilling unit.

The similar -- similar problems were seen in the No. 1 Well, however, it only got up to 18 degrees so it wasn't quite as crucial as the 28 degrees seen in No. 2.

Currently we are proposing to drill the 1-E up to approximately 29 degrees.

Q Let me direct your attention, Mr. Decker, to Exhibit Number Eleven, and have you identify and describe that exhibit.

A Exhibit Number Eleven is a Dakota stratigraphic cross section going through the proposed well. It is listed as A-A', going from east to west. The datum for this stratigraphic cross section is the Graneros Shale, and what I'd like to show within this exhibit is the deteriorating stratigraphy, or thickness, of the Dakota B Sand interval as you go from east to west.

And if you'll also notice in the furthermost western well, the Airport No. 1, this well was P&A'd in 1961 after producing only 76-million cubic feet of gas.

This stratigraphic cross section does reflect a fluvial and channel environment which is a tough environment, deposition to always predict.

Q Let me direct your attention back to Exhibit Number Six, which is the AFE that Mr. Heringer has submitted to those individuals with whom he could find with ownership in the east half of -- of the section, and based upon your drilling experience with the No. 2 Well in the section, describe for us whether or not you have an opinion as to whether the estimated well cost for the infill well, the Com 1-E, are fair and reasonable.

A Yes, I do believe they are fair and reasonable.

Q Okay. Can you describe for us generally

how these costs relate to the costs involved in drilling the other well, the No. 2 Well that was deviated at such a similar distance?

A From -- from these costs here in the No. 2 Well, the directional portion is more, approximately $20,000 more than in the original No. 2 Well; however, the costs are not substantial enough to greatly alter the total cost that we see between the original AFE cost in the No. 2 and this original AFE cost in the 1-E.

MR. KELLAHIN: That concludes my examination of Mr. Decker. We'd move the exhibits on -- introduction of Exhibits Ten and Eleven.

MR. CATANACH: Exhibits Ten and Eleven will be admitted into evidence.

CROSS EXAMINATION

BY MR. CATANACH:

Q Mr. Decker, you've got quite a large number of wells for control in this area, is that -- is that correct?

A Fair amount, yes.

Q How confident do you feel at this point that you'll hit that -- over that 16 feet of sand in the proposed well?

A I feel reasonably confident that we will

get over the 16 feet; however, since this is a fluvial environment, this channel that is coming through there, as noted by the darkened 20-foot contour, that could easily be contoured to where the location of the channel would be more to the east and which would follow the 27 feet, which is located in the well southwest of No. 2, and come down to our Ervin Com 1-E, which is in Section 11, northwest corner of Section -- excuse me, of section -- northwest quarter of Section 11 of 24 feet, and then down to our No. 1 location that we drilled last year.

I could easily contour this Isopach to reflect the channel would come through those three locations and then have sand quality drop off to where we would only anticipate 15 feet, or maybe even less, within that 1-E location.

Q You say that 16 feet is your cutoff point for a commercial well? Is that what you said?

A The 16 feet is an approximation based on what we've seen of time, the net pay value of the wells located in this area, back to estimated ultimate recoveries, and 16 feet would make it an economic location.

MR. CATANACH: That's all I have. The witness may be excused.

TIM HOWAR,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Howar, for the record would you please state your name and occupation?

A Tim Howar. I'm a Senior Reservoir Engineer with Tenneco Oil in Denver, Colorado.

Q Mr. Howar, have you made an engineering study of the risks involved in drilling the subject infill well, the Com 1-E?

A Yes.

Q And pursuant to that study have you prepared or caused to be prepared Exhibits Twelve and Thirteen?

A That's correct.

MR. KELLAHIN: We tender mr. Howar as an expert petroleum engineer.

MR. CATANACH: He is so qualified.

Q Mr. Howar, would you refer to Exhibit Number Twelve and take a moment and describe the display to the Examiner?

A Yes, what Exhibit Twelve is, is it's de-

signed to go hand in hand with Exhibit Ten, which Mike detailed. What Exhibit Twelve indicates are the cumulative productions, production from all of the Dakota wells in the area, as well as the date the wells came on.

Specifically what I use this to illustrate is primarily with the wells that were drilled 20 years ago or more, in the 1960's, and there's a very good correlation, I think, between the production to date, which for all intents and purposes is ultimate, with the net pay as mapped on Exhibit Ten.

You can see as you trend towards the west the quality of production does drop off significantly and if you -- you could almost draw a vertical line, I think, through Section 10 indicating a line of where the wells are what we call good wells and where it gets into areas where we probably wouldn't want to be drilling, and it, I think, supports the net pay map that Mike detailed.

Q The Examiner is authorized by the statute to enter a risk factor penalty against any nonconsenting owners up to a 200 percent penalty. Have you made an engineering evaluation and study of the known production in order to arrive at your recommendation to the Examiner as to that risk factor penalty percentage?

A Yes, I have.

Q The Examiner asked Mr. Decker about the

large number of wells in here establishing sufficient geologic control and therefore perhaps reducing the geologic risk. Mr. Decker concluded that notwithstanding the large number of wells, that there was still a significant geologic risk.

Let me ask you a similar question. In view of the large number of Dakota wells and the established production and producing characteristics, do you have an opinion as to what that percentage risk factor penalty ought to be?

A I would recommend 200 percent.

Q All right, why?

A If you look at -- if we can jump ahead to Exhibit Thirteen?

Q All right, let's do it.

A What this is designed to do is illustrate the magnitude of how much production quality we lose in just dropping from 24 to 16 feet of net pay. When you think of going from 24 to 16 feet of net pay it doesn't seem it's that big a deal but the line below the net pay line illustrates the current capacity of the two wells. The City of Farmington Com No. 1 is a good well, admittedly. Its current capacity is about 2.4-million cubic feet per day; however, the City of Farmington No. 2 Well is below 700 a day. So you can see dropping off 8 feet, cutting your net pay by

25 percent, we're seeing probably 3-1/2-fold decrease in capacity and that would translate directly to ultimate recovery.

What Mike got -- what Mike Decker talked about when he looked at Exhibit Ten, if in fact that fluvial channel does trend away from the Com No. 1-E and we lose a net pay down to the 16-foot or less, it's probably -- it's -- the results for that well would be very similar to what we see in the City of Farmington No. 2 Well and at present that's not really a well I'd recommend to drill.

Q Let's talk about the second portion of Exhibit Number Thirteen and talk about the pressure information that you've displayed.

A The first line is the original pressure for the two wells. We had anticipated essentially hitting virgin reservoir pressure with those two wells and that's -- I estimated that to be around 2000 pounds and that's what both of the wells did test.

Currently that reservoir pressure, though, is down around 1600 pounds. The two shut-in pressures were obtained from this past month, the Farmington plant was down for about a month and a half so the wells were shut-in for that period and we were able to obtain relatively good shut-in pressures.

What I included that for, it was just to

illustrate that the reservoir pressure is decreasing somewhat in Section 10, and we may or may not hit virgin pressure when we drill the 1-E. That would just add further risk to the net pay question.

Q Let me direct your attention back to Exhibit Number Three, which is the -- I'm sorry, Exhibit Numbaer Six, which is the proposed AFE for the well, and ask you to comment, sir, on whether or not you have an opinion about that AFE as to whether it's fair and reasonable.

A Yes, I think it's fair and reasonable. In fact it might be a little bit low, personally, just because I checked and both of the AFE's for the previous two wells drilled we've -- we've been low. We were about $50,000 over on these. Most of that was involved in some of the problems we had that Mike detailed in getting through the Mancos and having trouble building our angle and maintaining that angle and having to use -- experiencing more costs in directional drilling.

I think we have not inflated this AFE to reflect that. I think our feeling is we should be able to do this one, hopefully, anticipating those problems, so I think this is an accurate estimate of the costs that we will incur, but there is -- there is risk that we could again go over AFE.

Q If you establish Dakota production with

the infill well, do you have a market for that gas?

A Yes. We -- currently the gas is being sold to the city and going through the plant in the City of Farmington, and specifically, that's why we are drilling this well. We anticipate, because of the quality of production from the No. 2 Well, it wasn't what we had hoped for, we anticipate we'll fall below the demand that the plant asked for sometime in this upcoming year of '88, so we're driling this third well to be able to meet that demand.

Q Were Exhibits Twelve and Thirteen prepared by you or compiled under your direction and supervision?

A Yes.

MR. KELLAHIN: We move the introduction of Exhibits Twelve and Thirteen.

MR. CATANACH: Exhibits Twelve and Thirteen will be admitted into evidence.

CROSS EXAMINATION

BY MR. CATANACH:

Q Mr. Howar, reservoir sand thickness is not the only variable in determining the productive capabilities of these wells, is it?

A No. Oh, no; however, if I might, I'm not sure what you're referring to but porosity, the other fac-

tors that will enter into that tend to behave similarly to sand thickness. A drop off in sand thickness generally will be a drop off in the quality of the rock, as well.

Both the wells, the City No. 1 and No. 2 were completed, acidized, in exactly the same manner, so I'm fairly confident that any discrepancy in production quality is not a result of completion technique.

MR. CATANACH: That's all the questions I have of the witness. He may be excused.

MR. KELLAHIN: That concludes our presentation in this case, Mr. Examiner.

MR. CATANACH: There being nothing further in Case 9265 it will be taken under advisement.

(Hearing concluded.)

C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY the foregoing Transcript of Hearing before the Oil Conservation Division (Commission) was reported by me; that the said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability.

Sally W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 9265, heard by me on November 18 1987.

David R. Catanach, Examiner
Oil Conservation Division