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

19 November 1986

EXAMINER HEARING

IN THE MATTER OF:

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| Case 8696 being reopened pursuant to the provisions of Order No. R-8062, Lea County, New Mexico. and Case 8790 being reopened pursuant to the provisions of Order No. R-8062-A, Lea County, New Mexico. | CASE 8696 CASE 8790 |

BEFORE: David R. Catanach, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

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| For the Division: | Jeff Taylor<br>Attorney at Law<br>Legal Counsel to the Division<br>State Land Office Bldg.<br>Santa Fe, New Mexico 87501 |
| For Pennzoil: | W. Thomas Kellahin<br>Attorney at Law<br>KELLAHIN, KELLAHIN, & AUBREY<br>P. O. Box 2265<br>Santa Fe, New Mexico 98501 |
| For Exxon: | James G. Bruce<br>Attorney at Law<br>HINKLE LAW FIRM<br>P. O. Box 2068<br>Santa Fe, New Mexico 87501 |

# APPEARANCES

For Phillips Petroleum: Peter N. Ives
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# INDEX



# EXHIBITS

MR. CATANACH: We'll call next Case 8696.

MR. TAYLOR: In the matter of Case 8696 being reopened pursuant to the provisions of Order No. R-8062, which promulgated temporary special rules and regulations for the Shipp-Strawn Pool in Lea County, including a provision for 80-acre spacing units.

Operators in said pool may appear and show cause why said pool should not be developed on 40-acre spacing units.

MR. CATANACH: Are there appearances in this case?

MR. KELLAHIN: Yes, Mr. Examiner. I'm Tom Kellahin of Santa Fe, New Mexico. I'm appearing on behalf of Pennzoil.

We are prepared to present evidence in support of the continuation of the special pool rules, including the provision for 80-acre spacing.

MR. BRUCE: Mr. Examiner, my name is Jim Bruce from the Hinkle Law Firm in Santa Fe, representing Exxon Corporation.

And I just will have a short statement to make.

MR. IVES: Mr. Examiner, my name is Peter Ives with the firm of Campbell & Black, enter-

ing an appearance on behalf of Phillips Petroleum Company, and I will not have any witnesses.

MR. CATANACH: Okay, Case 8696 and Case 8790 will be consolidated for the purpose of the testimony.

Please call Case 8790.

MR. TAYLOR: In the matter of Case 8790 being reopened pursuant to the provisions of Order No. R-8062-A, which in part amended the temporary special rules and regulations for the Shipp-Strawn Pool in Lea County, including a provision for 80-acre spacing units.

Operators in said pool may appear and show cause why said pool should not be developed on 40-acre spacing units.

MR. CATANACH: I assume we have the same appearances in both cases?

MR. KELLAHIN: Yes.

MR. BRUCE: Yes, Mr. Examiner.

MR. IVES: Yes.

MR. CATANACH: You may proceed, Mr. Kellahin.

MR. KELLAHIN: Thank you, Mr. Examiner.

Back in the summer of last year Mr. Quintana heard the Case 8696 based upon the application

of Pennzoil to establish a new pool and to designate 80-acre spacing for what was declared to be the Shipp-Strawn Pool.

Pennzoil, as the applicant, requested in addition the flexibility of well locations so that within the 80-acre tract so long as the well was located no closer than 330 feet to the outer boundary of that tract, then they were standard well locations.

Subsequent to the entry of that order, which was R-8062, the Division staff decided they wanted this pool, as well as other pools, to remain upon a spacing formula that required standard locations to be within 150 feet of the center of a quarter quarter section, and therefore Case 8790 was called, resulting in Order R-8062-A, changing the well location rule of the special rules, putting those locations, then, on 150 feet of the center of a quarter quarter section.

We have an engineering witness today to present evidence to support our original opinions in the earlier hearing and to reconfirm for you the justification for the 80-acre spacing rule.

MR. CATANACH: Sorry, will the witness please stand and be sworn in?

Are there any other witnesses in this case?

(Witness sworn.)

RANDY HODGINS,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q All right, sir, would you please state your name and occupation?

A I'm Randy Hodgins. I'm a petroleum engineer.

Q Mr. Hodgins, have you previously testified as a petroleum engineer before the Division?

A Yes, I have.

Q Pursuant to your employment by Pennzoil Company, have you made a study of the engineering facts surrounding our proposed continuation of the special pool rules for the Shipp-Strawn Pool?

A Yes.

Q And pursuant to that study have you compiled and made exhibits from the fiel, including exhibits of your own?

A Yes.

MR. KELLAHIN: We tender Mr. Hodgins as an expert petroleum engineer.

MR. CATANACH: Mr. Hodgins is

considered qualified.

Q Let me direct you, first of all, to Exhibit Number One, and have you identify for us that plat, starting with the location of the Shipp-Strawn Pool, as depicted on that exhibit.

A Exhibit One shows all the Strawn pools in the Shipp Field area, the Shipp Field being shown in red.

Q Are there any exceptions to special pool rules in this area whereby there are pools spaced upon other than 80 acres?

A Yes.

Q And which pools are spaced upon other than 80 acres?

A The Lovington East, which is two wells, Section 32 and Section 5.

Q They're indicated in the yellow?

A Indicated in the yellow.

Q Are there any producing wells left in that pool?

A No.

Q Apart from -- that's the Lovington East?

A Yes.

Q All right, apart from the Lovington East Pool, are there any other pools that have other than 80-acre spacing?

A No.

Q All right. Identify for us how you have depicted the Shipp-Strawn Pool on the exhibits.

A The Shipp-Strawn Pool is the area that's described in our temporary field rules, field outline.

Q All right, and it's shown on the exhibits in red?

A Yes.

Q And it's being portions of Sections 4 and 9.

A That's correct.

Q All right. What is the name of the pool to the southwest, located in Section 8? What is that pool?

A That's the Midway Pool.

Q And it's also on 80-acre spacing?

A Yes.

Q Why are you appearing on behalf of Pennzoil this morning, Mr. Hodgins?

A To show evidence that the temporary field rules should be adopted as the permanent field rules.

Q All right. Let's turn to Exhibit Number Two, then, and have you identify for us the spacing and proration units that are assigned to the existing wells in the Shipp-Strawn Pool.

A Exhibit Two shows the proration units to

the best of our knowledge. There in Section 9, the northeast -- northwest quarter of Section 9, we're not sure about that proration unit, but that's our best -- best estimate.

Q Can you identify for the examiner what the discovery well is for this pool?

A Yes.

Q And which one is that?

A The discovery well was the Vierson No. 1, which is the -- the proration unit is the east half of the southeast quarter of Section 4.

Q Okay, that's the Vierson No. 1.

A Yes.

Q Test your memory, Mr. Hodgins, what do you recall to be the order of drilling for subsequent wells, do you remember?

A The Vierson 1 was followed by the Vierson 2, which is in the west half of the southeast quarter.

The third well in the field was the Tipperary State 4 No. 1, which is the north half of the northwest quarter.

Followed by our Chipp No. 1 which is the west half of the northeast quarter.

Followed by the Tipperary State 4 No. 2, which is the osuth half of the northwest quarter.

That was followed by the Exxon "Ex" State

No. 2, which is the west half of the northeast quarter of Section 9.

And the most recent discovery in the field was the -- or addition to the field, was the Paskin's Consolidated State No. 3, which is the east half of the northeast quarter of Section 9.

Q As we look in Section 9, in the east half of the northeast quarter, the spacing unit just to the east of the Exxon well, what is the status of that well? What is that? Is that a location or is that a well?

A That's a producing well.

Q And is that in the Shipp-Strawn Pool?

A Yes.

MR. KELLAHIN: No?

A I'm sorry, I thought you was referring to the Paskin Well?

Q No, sir, I'm going the other direction. I am looking in the east half of the northeast quarter of -- Section 9.

A Okay.

Q -- Section 9.

A That is not a part of the pool.

Q All right.

A That's a Wolfcamp well.

Q So you have indicated the spacing and proration units in the dashed line around each of the pools.

that are currently dedicated to the Shipp-Strawn Pool.

A Yes.

Q All right. let's turn now, sir, to Exhibit Number Three and have you identify that for us.

A Exhibit Number Three is a lease ownership plat in the Shipp Field area.

Q Let me take you back, Mr. Hodgins, and have you review with us the state of information that Pennzoil had before Examiner Quintana back last year when we made the application for the temporary rules, and then after we do that, we'll go into the current information about the reservoir.

To do that, Mr. Hodgins, I have removed from the original case file 8696, 8697, Exhibits Seven, Eight, and Nine from that case file for reference, and I have given you a copy of those.

Let's go through those exhibits, Mr. Hodgins, and show Mr. Catanach what we knew about the reservoir at that time, starting with Exhibit Number Seven, if you please.

All right, sir, can you identify for us Exhibit Number Seven from the prior hearing?

A Exhibit Seven is a Horner, is a pressure build-up shown as a Horner plot.

Q And what's the purpose of this exhibit?

A It's just to illustrate the permeability of the reservoir.

Q Okay, and what is the illustration of the permeability of the reservoir as depicted by the Vierson No. 1 Well?

A It shows that they have a permeability of 43 millidarcies.

Q What significance do you attach as a reservoir engineer to the fact that this particular well in this pool has a permeability of 43 millidarcies?

A That 43 millidarcies will more than significantly drain 80 acres.

Q By comparison, to set us some general guidelines, Mr. Hodgins, if these wells were only capable of producing, say, 40 acre tracts, what kind of permeability range, then, would you see demonstrated by these wells?

A To drain 40 acres it would have to be less than 3 to 5 millidarcies.

Q So the fact that you have 43 millidarcies in the Vierson No. 1 Well to you is a significant fact in determining drainage?

A Yes, sir.

Q All right, let's go to Exhibit Number Eight from -- also from the prior hearing record and have you identify that exhibit for us.

A Exhibit Eight is a core analysis report from the Vierson 1.

Q To what purpose do you put this type of information?

A It further documents our permeability data and log data.

Q And does this core information confirm the information indicated on the permeability data?

A Yes.

Q In what way?

A It's in agreement with our build-up data and also subsequent coring is in good agreement with this report.

Q All right. Let's go to Exhibit Number Nine and have you identify that exhibit from the prior hearing.

A Exhibit Nine is -- shows the reservoir parameters, or some parameters which illustrate the quality of the reservoir rock.

Q Okay, and what was the conclusion at that time based upon the analysis of this information?

A That 80-acre spacing would -- the quality of the reservoir would be to drain 80 acres.

Q All right. That exhibit also shows a drainage calculation?

A Yes.

Q And is that a drainage radius that is adequate for purposes of draining 80-acre spaced tracts?

A Yes, it is.

Q Having reviewed the past history and the information in the prior case, Mr. Hodgens, are you now of the same opinion that Pennzoil was at that prior hearing, that 80-acre spacing is still justified?

A Yes.

Q All right. Let's talk about the reasons that you've come to that conclusion and have you look now, sir, at Exhibit Number Four for today's hearing.

Would you identify that exhibit for us?

A Exhibit Number Four is another table showing reservoir parameters and quality of reservoir rock in the Shipp Field, which -- which is really in close agreement with our original exhibits.

It shows a permeability of 45 millidarcies, formation volume factor of 1.5, porosities of -- I've shown as 8 percent. They would range more than 13 percent. Water saturation I've shown as 15 percent. Again that would be a range of 12 to 25 percent would be acceptable. Recovery factors of 25 percent. Reservoir temperature, 160 degrees. Oil viscosity of 28 centipoise and oil gravity of 45 degrees.

Q So in terms of analyzing the reservoir parameters based upon the additional wells that have been drilled, you find that there is close agreement to the original parameters established.

A Yes.

Q And utilizing those parameters, they support your conclusion that 80-acre spacing is still justified?

A Yes.

Q All right, sir, let's go to Exhibit Number Five for today's hearing and have you identify that exhibit for us.

A Exhibit Five is another -- it's another pressure build-up plotted as a Horner plot, which shows the calculation of the permeability, 43 milidarcies.

Q All right, let's talk, sir, about what available pressure information that you have to show communication or interference between wells that are spaced 80 acres apart.

Can you give us an example of any instance in the reservoir where you have confirmation of interference between wells?

A Yes.

Q All right, let's use one of the plats. Perhaps Exhibit Number Two is the easiest one, because we've

used that to identify the wells.

Let's go back to Exhibit Number Two and have you tell us what information you have that has caused you to believe that you have confirmation of interference between wells on 80-acre spacing.

A Okay, the best example would be an interference test which we ran between our "BE" Shipp No. 1, which is the west half of the northeast quarter and Tipperary's State 4 No. 1, which is the north half of the northwest quarter. Those wells are approximately 1650 feet apart.

Tipperary at the time was producing their well. We had just completed our Shipp, "BE" Shipp No. 1. Prior ot any production we -- we kept the well shut-in, used it as an observance well to observe the pressure transients created by Tipperary's State 4 No. 1, and we modeled those. Prior to actually going out and measuring the transients, we modeled it, come up with a number that we were looking for as far as what transients we should be seeing created by their well, and upon measuring those transients it was conclusive that those two wells were definitely in communication.

Q Do you recall what the pressure numbers were in terms of the modeling and what the measured performance was between the wells? Can you give us an example of

the ranges of pressure you were talking about?

A I can't recall the exact number but the range was approximately .1-.2 psi drop per day. That's what the model showed it should be and that's what the actual measurement showed.

Q All right, sir, let's turn to Exhibit Number Six, now, and have you identify and describe the information on Exhibit Number Six.

A Exhibit Number Six is further documentation of reservoir parameters. It's a core analysis report from the Vierson No. 2.

Q All right, just a minute before you describe it.

We had a prior Exhibit Number Eight that had core information on the Vierson No. 1 and now the Exhibit Number Six you have is for the Vierson No. 2?

A That's correct.

Q All right, these are wells that are located in the southeast quarter of Section 4.

A Yes.

Q All right, compare for us the log information between the two wells.

A Log information?

Q Yes, sir.

A The core? Core information?

Q I'm sorry, the core information.

A Although we only recovered 3 feet from the Vierson 1, I think you could say that it was in agreement with the Vierson No. 2, although in the Vierson No. 2 we -- we had a full 30-foot core.

Q Let's look at Exhibit Number Six and tell us what you conclude as an engineer from analyzing that information.

A Well, in the porosity column you can see that the porosities range from 4 to 13 percent, which is what I've used as an acceptable range on our parameter table.

One thing that may look -- may look to be not in agreement is the water saturation from the core report, but you have to keep in mind that this core has been flushed by drilling fluids.

So the core analysis is in good agreement with our electric logs and it's all summarized on our reservoir parameter exhibit.

Q The core analysis reconfirms, then, the permeability range that you have used on the parameter exhibit.

A Yes.

Q All right, sir. Having satisfied yourself, Mr. Hodgins, that the wells in the pool are capable of

draining and producing on 80-acre spacing, did you further make an examination of what the economic consequences or impact would be on drilling wells on 80-acres versus 40 acres?

A Yes, I did.

Q All right, sir, and have you prepared an exhibit to demonstrate that study?

A Yes, that is Exhibit Number Seven.

Q All right, sir. Turn your attention to Exhibit Number Seven and identify and describe what you've done in making the comparison.

A Exhibit Seven shows a comparison of the 40 versus 80-acre spacing. It shows that the number of wells would double; that for 80-acre spacing we'd only need one well and for 40 you would need two. Subsequently the capital investment would double. Your -- your oil and gas reserves, however, would stay the same. Producing life would decrease five years in the 40-acre spacing, which really, the only thing 40-acre spacing would do for you would be just accelerate the life of your wells.

The capital investment per equivalent barrel of recovery would double with 40-acre spacing, shown as $2.93 per barrel for 40 acres as opposed to $1.47 per barrels on 80-acre spacing.

So 40-acre spacing would be an economic loss.

Q In establishing the fact that 40-acre wells will not recover any more oil than an 80-acre well, and using the same well costs per well, the advantage of 40-acre spacing, then, in your opinion is simply -- reduces the time it takes you to extract the oil, and accelerates your rate of production.

A Yes.

Q The converse is that it also doubles the cost of the investment per barrel of oil that you would have to spend in order to get that oil out quicker.

A That's correct.

Q But you do not see, and based upon all your studies, that the second well is going ot produce any more reserves than one single well alone on 80 acres.

A No, based on the excellent quality of the reservoir rock, 80 acres will recover the same amount of reserves that two 40-acre spacing wells will.

Q In your opinion will the drilling of two wells per 80 acres constitute the drilling of at least one unnecessary well?

A Yes.

Q In your opinion should the Commission make permanent the existing special pool rules for the Shipp-Strawn Pool?

A Yes.

MR. KELLAHIN: That concludes our examination of this witness, Mr. Catanach.

We move the introduction of Exhibits One through Seven.

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

MR. BRUCE: We have no questions.

MR. MARK MARTIN: Sir, my name is Mark Martin. I'm with Tipperary Oil and Gas and we have two of the wells in there and I just want to make a statement that we want to support making permanent the 80-acre spacing, and I have a letter to you to that effect that I'd like to give at this time.

MR. CATANACH: Okay.

CROSS EXAMINATION

BY MR. CATANACH:

Q Mr. Hodgins, you didn't submit any actual intereference data. Is that -- is that available?

A It's available but I don't have it.

MR. KELLAHIN: Mr. Catanach, that is to have been Federal Expressed to my office this morning. It has not yet shown up. We'll be happy to provide that information to you to reconfirm Mr. Hodgins' tes-

timony about the interference information. If I'n allowed that opportunity, I'd be happy to bring it over to you.

MR. CATANACH: Okay, thank you very much.

Okay, I have nothing further of the witness. He may be excused.

MR. KELLAHIN: I have nothing else to present.

MR. BRUCE: Mr. Examiner, I just merely want to state on behalf of Exxon that they support Pennzoil's presentation in this matter.

MR. KELLAHIN: Mr. Examiner, your file should also indicate a letter dated November 12th from Amerind Oil Company, also in support of 80-acre spacing.

MR. CATANACH: Thank you, Mr. Kellahin.

Is there anything further in Case 8696 or Case 8790?

If not, they 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 that 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. 8696 & 8790 heard by me on Nov 19, 1986

David R. Catanach, Examiner
Oil Conservation Division