BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
February 19, 1964

EXAMINER HEARING

IN THE MATTER OF:

Application of Nearburg & Ingram for the creation of a new gas pool and for special temporary pool rules, Roosevelt County, New Mexico.

Case No. 2996

BEFORE: ELVIS A. UTZ, EXAMINER

TRANSCRIPT OF HEARING

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MR. UTZ: Case 2996.

MR. DURRETT: Application of Nearburg & Ingram for the creation of a new gas pool and for special temporary pool rules, Roosevelt County, New Mexico.

MR. RUSSELL: John F. Russell, Roswell, New Mexico, representing the applicant. I have one witness.

(Witness sworn)

RALPH L. GRAY,

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

DIRECT EXAMINATION

BY MR. RUSSELL:

Q Will you please state your name, address and occupation?

A My name is Ralph L. Gray, my occupation is Consulting Petroleum Engineer.

Q Where do you live, Mr. Gray?

A Artesia, New Mexico.

Q Have you previously qualified to testify before the Commission?

A Yes, I have.

Q Are you familiar with the application of Nearburg & Ingram in Case Number 2996?

A Yes, sir.

Q Will you briefly state what the application seeks?

A This application proposes to create a new gas pool and to establish 320 acre drilling units, and also to provide for a uniform spacing pattern for the pool.

Q Mr. Gray, referring to what has been identified as Exhibit One, will you explain what that exhibit portrays?

A Exhibit One is a map which shows this general area. It also shows the structural conditions with contours drawn on top of the San Andres formation. The map shows an outline of the proposed pool boundary which is indicated by red on the map. All of the portion of the map colored yellow indicates tracts in which Nearburg and Ingram have an interest.

Q Will you give the location of the two wells which have been drilled or completed within this proposed area?

A Yes. The Nearburg and Ingram Kirkpatrick Number One is located in the Southeast Quarter of the Southeast Quarter of Section 11, and Township 8 South, Range 37 East. And the Kirkpatrick Number Two well is located in the Northwest Quarter of the Northeast Quarter, Section 14, and the same township and range.

Q And the proposed area outlined in red is Sections 10, 11, 12, 13, 14 and 15?

A That's right.

Q Of Township 8 South, Range 37 East?

A Yes, sir.

Q And the plat also shows all leases and wells within one mill of the proposed boundary?

A Yes, sir.

Q And the two wells which you have described are the only wells within the proposed area; is that correct?

A That's correct.

Q I refer you to Exhibit Two and ask you to explain what that shows? After we go through these various exhibits, after indicating what they portray, if there is anything significant which you want to point out as to any exhibit, do it at that time.

A Exhibit Two shows a Gamma Ray Sonic log through the pay portion of the reservoir, and also shows core data plotted. Also

shows the perforations from which the well produces or is producing, and the net pay intervals are also indicated on this log.

Q All right. Referring to what has been identified as Exhibit Three, and ask you to explain that exhibit?

A Exhibit Three shows a portion of the Gamma Ray Nuetron log for the Kirkpatrick Number Two and this also shows the casing depth and perforations from which the well produces.

Q All right. Now, refer to Exhibit Four, and ask you what that portrays?

A Exhibit Four is a coregraph showing the porosity and permeability and other core data for the various intervals which were cored and analyzed. This log also indicates the fracturing that exists in the formation.

Q All right. Now, I refer you to Exhibit Number Five and ask you to explain that one?

A Exhibit Number Five shows pertinent well data for the Kirkpatrick Number One well showing the total depth and the elevation, casing depth, perforations, treatment, and the drillstem test. This shows a completion date of November 20th and I believe maybe that conflicts with the- - perhaps that should be November 22nd in order to agree with the operator's records.

Q And November 22nd is the date shown in the application?

A Yes, sir, that is the correct date.

Q All right. I will now refer you to Exhibit Number Six and ask you to explain that one?

A Exhibit Number Six is also a sheet showing well data for the Kirkpatrick Number Two well, showing similar information which was shown in Exhibit Number Five.

Q All right. Now, turn to Exhibit Number Seven.

A Exhibit Number Seven shows the results of a multiple point back pressure test which was conducted on the Kirkpatrick Number One well. This shows that the well has an absolute calculated open flow of 1,675,000 cubic feet of gas per day. This exhibit also shows conditions of various rates of flow during the test, with the surface pressure and the bottom hole pressure for those particular rates.

Q All right. Now, to Exhibit Eight.

A Exhibit Eight is a similar data for the Kirkpatrick Number Two. This shows the back pressure test conducted on this well and it shows an absolute open flow of 890,000 cubic feet of gas per day.

Q Mr. Gray, based upon the information contained in the exhibits you have referred to, in your opinion, will one gas well in the San Andres formation within the proposed pool boundary efficiently and economically drain 320 acres?

A Yes, sir, it is my opinion that it will.

Q Will you please point out the specific data upon which you base that opinion?

A Well, this Kirkpatrick Number One well was cored through the pay section, and the cores showed evidence of a high degree of

fracturing in the formation, and,of course, this is the type of permeability that permits a good drainage and good recovery in a reservoir.

Q Have you made any computations reflecting the cost of drilling an operating a San Andres gas well in the proposed area, based upon a 160 acre spacing and a 320 acre spacing in connection with the economic return for each?

A Yes, I have.

Q What are those figures or computations?

A My calculations show that the approximate cost for drilling a well, equipping the well, would amount to approximately $45,000.00. The estimated operating cost over the life is calculated to be $8,400.00 based on a 160 acre drilling tract, and operating cost for a 320 acre tract is estimated at $14,400.00. The total expense for drilling on the basis of 160 acre tracts would be $53,400.00 and $59,400.00 for a 320 acre tract. Now, as to the value of gas that can be recovered, it is estimated that the recoverable gas for a 160 acre tract would amount to 783,576 MCF, and for 320 acres, would be 1,566,752 MCF. It is estimated that the value of the working interest gas for a 160 acre unit would be approximately $45,788.00, and for a 320 acre tract, would be approximately 91,576.00. So, in comparing the anticipated income for a 160 acre tract and a 320 acre tract, as against the estimated expense, it is very clear that drilling on a 160 acre unit would result in a loss to the operator, whereas, drilling on a 320 acre

tract would perhaps allow a small profit.

Q If it be set up on 160 acre spacing, there are not too many operators, on the basis of the information you have given, who would develop it?

A I can't imagine any operator wanting to drill on 160 acres.

Q And the economic loss factor would result in non-development of this area and the consequent loss of gas; is that correct?

A I think that's correct.

Q Do you have any recommendation to make to the Commission as to the formation of standard units within the proposed gas pool?

A I would recommend that any two contiguous quarter sections within a single governmental section be permitted to form a 320 acre unit. These could be formed in either a north-south or east-west direction.

Q And do you have any recommendation as to fixed well locations on the basis of those units?

A Yes, it is recommended that the wells be located in either the Southeast Quarter, or the Northwest Quarter of a section.

Q And in your opinion, that would provide for an orderly development of the pool?

A Yes, sir.

Q Now, do you recommend that an exception to the stated fixed well locations be granted for wells drilled or drilling prior to the establishment of the pool boundaries?

A Yes, I think exception should be permitted these wells.

Q Referring you back to Exhibit One, the Kirkpatrick Number Two well is not on one of the fixed locations, which you have recommended, is it?

A No, sir.

Q Can you give, or will you explain the reason for that?

A The Kirkpatrick Number Two well was originally drilled by Shell Oil Company, I think, in 1954, and was plugged in that year, and in November, 1963, Nearburg and Ingram re-entered this hole and made a completion in the gas zone.

Q It was drilled and abandoned prior to the drilling of the discovery well of Kirkpatrick Number One; is that correct?

A Yes, sir, that's correct.

Q In your opinion, do you feel that there are any conditions existing, in the proposed pool, which would require any casing program?

A No, we do not have any recommendations to make regarding any special casing program.

Q Do you have any recommendations to make as to a name for this gas pool?

A It is recommended that the gas pool be named the Bluitt-San Andres Gas Pool.

Q How do you spell that?

A B-l-u-i-t-t-.

Q Were these exhibits all prepared by you or under your

direction?

A Yes, sir.

MR. RUSSELL: I would like to offer in evidence at this time Exhibits One through Eight, inclusive.

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

Q (By Mr. Russell) And you are asking that temporary rules be set up for development of this gas pool?

A Yes.

Q Giving the operator time to obtain additional information to present as to the boundaries of the pool and capabilities of draining the 320 acres with one well; is that correct?

A Well, I think it is generally the policy that the Commission has to set up field rules similar to this on a temporary basis, however, I don't think my client would object to a permanent set of rules.

Q You think that he would take it on a permanent basis if it was offered?

A Yes, sir.

MR. RUSSELL: I have no further questions.

* * *

MR. UTZ: You feel safe in that latter statement, do you?

A Yes, sir.

MR. UTZ: Are there questions of the witness?

CROSS EXAMINATION

BY MR. PORTER:

Q Mr. Gray, you said, but who drilled this Number Two well?

A Shell Oil Company.

Q Shell Oil Company. What I am trying to determine here, there was a Bluitt-San Andres Oil Pool in this area. Do you know whether, or not any of those wells are still producing, whether it is in this particular area, or not? I didn't check it before the hearing.

A There was a well in Section 18 of Township 8 South, Range 38 East, which was originally completed as an oil well and it is my understanding that this well has been plugged.

Q That was over near the State line; is that right?

A Well, this well is just approximately half a mile east of the boundary that isshown on the map for the proposed gas pool.

Q I haven't checked the status of that pool in sometime.

A It is my understanding that it has been plugged.

Q As I recall, this was a well somewhere in the depth of around 5,000 feet or 5200, but anyway, in this particular area that you are requesting now, there is no San Andres oil production at the present time?

A No, sir, there is not within these proposed boundaries.

MR. PORTER: That's all I have.

* * * *

CROSS EXAMINATION

BY MR. UTZ:

Q Referring to your coregraph, which I believe is Exhibit Number Four, are the zones shown here perforated in the Number One well?

A I am sorry, I missed your question.

Q Are the zones here, as having been sampled in your core, are they the zones that are completed in the Number One well?

A Yes, the zone that is shown on the lower portion of the coregraph is the bottom zone that is perforated, and shown on Exhibit Number Two in the lower perforations, and then, the coregraph shows some core data from 4519 to 4538, and that is depicted on Exhibit Two.

Q All right.

A If you will notice under core data on Exhibit Two, there are two things shown by,the porosity is shown by a solid dotand permeability is shown by a hollow dot, and all of these are also shown on the coregraph, which is shown on Exhibit Four.

Q Really, the only zone that has very much permeability is your upper zone; is that a reasonable interpretation?

A Well, I would like to explain just a little bit about the permeability that is shown on this coregraph. The type of analysis which was run on the cores was - - is what we call a linear type of permeability measurement, and it measures permeability in a

certain direction and in a certain local area on the core, and you will note that most of these permeability measurements that are shown on the coregraph are a very low order of permeability, but the fallacy is,in taking these permeability measurements,that as a general rule, they will miss one of these fractures unless you just happen to take this permeability measurement right on one of these fractures, you don't actually determine the permeability that exists in the fracture itself. So, anyway, the permeability measurements that are shown on the coregraph are misleading in that they don't show accurately the permeability that actually exists in the fracture itself.

Q Is the entire section of the core checked for permeability or just slugs taken out of the core and checked?

A Only the sections which are shown on the coregraph in Exhibit Four were the parts of the core that were analyzed. The other parts were not thought good enough to make an analysis of.

Q And this core was then fractured?

A Yes, sir.

Q Would you say it was highly fractured, or partially fractured?

A Yes, I would say it was highly fractured. Now, if you will note on the coregraph, the column shown directly after total water under residual saturation, there is a column there that shows a large number of "F's" all up and down where the core was analyzed. These "F's" mean "fractured". So, you will notice

there, practically all of the pay section was highly fractured.

Q And these fractures are in all probability the reason for the accumulation?

A Yes, I think so.

Q Of course, the permeability in fractures are very high; is that true?

A Yes, generally, fractured permeability is of a high order.

Q These absolute open flows that you have shown here, aren't what you would term as being real rip roaring gas wells, are they?

A Well, no, and yet, they are, I would say they are fair. Here is one that has a calculated absolute open flow of a little more than a million and a half a day. In considering that this is a shallow reservoir and that the reservoir pressure is not too high, I think they are reasonable, the absolute open flows are within reasonable brackets.

Q Would you ordinarily expect a fractured reservoir to have a little higher- -

A If you have a deeper reservoir with higher pressure, you would, but in such a shallow reservoir, I think it is about what you might expect.

Q Are these bottom hole AOF's, or top hole?

A Pardon?

Q Are these absolute open flows at the surface or bottom hole absolute open flows?

A They are calculated in accordance with the Oil Conservation Commission methods.

Q You used your surface pressure in making this calculation?

A Well, surface and measurements were taken both at the surface and at the bottom of the hole.

Q Which pressure was used in making the calculation, the bottom hole pressure or the surface pressure, do you recall?

A Well, it is based on our surface pressure.

Q Absolute open flows would be absolutely lower than the bottom hole pressure, absolute open flow pressure?

A Yes, sir, that's right.

Q Would you say that this pool was stratigraphic trap?

A Yes. I think generally, the geologists consider that this is a stratigraphic type of reservoir.

Q I note that you have asked to be included in the pool rules six sections which have previously been described and are shown on Exhibit Number One. In your opinion, are all of these sections productive of gas from this zone, or is this just an area which you would desire to be lineated for spacing purposes?

A Well, based on the information which we have at this time, we think that all of the area included within the proposed pool boundary is probably productive of gas in this formation and it doesn't necessarily show what might be the entire size of the reservoir, but when you start out with only two wells, well, you have to arrive at some reasonable estimate of the size of the pool,

and this essentially takes in all of the offsetting drilling units that might be formed around these wells, and it is just the operator's recommendation for an initial pool boundary, and we think that in time, of course, this will probably be extended.

Q You are familiar with the usual order that is written in spacing cases by the Commission in that any well a mile or less from the pool shall be operated in accordance with the pool rules, are you not?

A Yes, sir.

Q That rule in itself would take in vertually all of this area which you recommend here, except the West Half of Section 10 and 15, would it not?

A Yes, sir, that's right.

Q I wonder if you would go through your economic figures once more for me. I didn't get quite all of them jotted down.

A Is there anything specific that you would like to ask or would you prefer that I- -

Q Well, the well cost on 160 and 320 acres, as well as your gross income, your operating cost and so forth. I think probably all of it.

A All right. The estimated well cost and lease equipment cost, this is combined in one figure, is estimated at $45,000.00. The estimated operating cost over the life is $8,400.00 for 160 acre tract and $14,400.00 for a 320 acre tract. The estimated recoverable gross gas from the 160 acre tract is 783,376 MCF, and

for 320 acres, 1,566,752 MCF. Now, the estimated value for the working interest gas is $45,788.00 for 160 acre tract, and $91,576.00 for 320 acre tract. The net loss for 160 acre tract would be $7,612.00, and net profit for 320 acre tract would be $32,176.00 with no discount factor applied.

Q In calculating these reserves, what kind of net pay did you use?

A We used a net pay of 26 feet for each of these wells.

Q Porosity?

A An average of 5.5 percent.

Q And your connate water?

A 20 percent.

Q And you used a bottom pressure as shown on Exhibit- - your absolute open flow exhibit?

A Well, we used an average bottom hole pressure for this well of 1495 pounds per square inch absolute.

Q For a recovery factor, what did you use?

A We didn't actually use a recovery factor. We approached it in a little different manner. We estimated the original total gas in place and then, we estimated the abandonment pressure and estimated the remaining gas in place in the reservoir at the time of abandonment, then we subtracted the two to come out with our recoverable gas.

Q What was your abandonment estimate?

A We used 415 pounds per square inch absolute.

Q Reservoir, no doubt?

A Yes, sir.

Q You don't believe that gas will be taken out of the reservoir at pressures below this?

A No, I don't. Exhibits Seven and Eight show both the tubing pressure at the surface and also the bottom hole pressure under these varying rates of flow conditions, and if you will note there, roughly there is about 200 pounds difference between your bottom hole and your surface pressure. And, of course, this is due to the weight of the column of gas and it is also due to the friction loss that occurs in getting from the bottom of the hole to the surface. So, you have at least 200 pounds there and then, if you assume that you need, say, an additional 100 pounds at the surface to buck the line pressure of the market outlet, you come out with about 300 pounds. You have to have some kind of pressure differential in your reservoir, and if you use another 100 pounds there, you come out with at least 415 pounds per square inch absolute that you will have to abandon at.

Q Of course, at your low flows the friction does becomes less and less a factor, does it not?

A Yes, sir, that's right.

Q However, the weight in the column is about the same, isn't that true?

A Yes, sir.

Q So, you do have, as compared with the abandonment flows

and the flows taken here, this probably would not be too far off?

A Well, except as you progress in depleting a reservoir, you are draining further away from the bore hole all the time so that your friction within the formation, I think, gets greater as you produce the well.

Q What use is being put to the gas from this pool?

A The gas will be piped to the gasoline plant, which is located in the Allison Pennsylvanian pool and is operated by Nearburg and Ingram.

Q All this gas will go to the plant for stripping and the residue will be sold to Interstate Commerce?

A My understanding is the residue gas is sold to the Transwestern.

MR. UTZ: Are there other questions of the witness?

* * *

RECROSS EXAMINATION

BY MR. PORTER:

Q Mr. Gray, did you say whether, or not either one of these wells made any liquid, any well head liquids?

A Very little. It is essentially dry gas.

Q Then, you would expect no liquids except those extracted at the plant?

A That is all.

MR. PORTER: Thank you.

MR. UTZ: Are there other questions? The witness may be excused. Do you have any further testimony?

MR. RUSSELL: No further testimony.

MR. UTZ: Are there other statements to be made in this case?

MR. CAMMACK: Mr. Examiner, I am Van Cammack with Atlantic Refining, and with your permission, I would like to state Atlantic's thoughts pertaining to this reservoir in this case. We don't have any acreage within the area, delineated here, but we do have some interest within the Allison-Bluitt Pool. Our own reserve estimates are very much in agreement with the reserves here presented by Mr. Gray, and the economics of such reserve pictures certainly support wise spacing, however, we think that one well can drain 640 acres, and we think that establishment of 320 acre proration units might lead to drilling unnecessary wells at this time. Our own economics indicate that 640 acres is more desireable, however, 320 acres will show a profit.

Now, if it is within the call of the hearing here as it was advertised, we would recommend that 640 acres be established as a standard unit with an option to drill on 320 acres if an operator prefers to have his wells on that close a spacing.

Then, we would recommend that allocation in the gas market, the individual wells in the pool be on an acreage basis.

MR. UTZ: I am afraid, sir, that 640 acre spacing would

not be within the call of the hearing. As I read it, it plainly states the application was for 320 acres.

Are there other statements to be made?

MR. DURRETT: If the Examiner please, the Commission received a telegram from Shell Oil Company stating they support the application.

MR. UTZ: Are there other statements? The case will be taken under advisement.

* * * *

STATE OF NEW MEXICO)

COUNTY OF BERNALILLO)

I, ROY D. WILKINS, 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, and 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 of Office, this 2nd day of March, 1964.

NOTARY PUBLIC

My Commission Expires:

September 6, 1967.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2986, heard by me on Feb. 19, 1964.

, Examiner
New Mexico Oil Conservation Commission

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