

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
August 20, 1958

IN THE MATTER OF,

CASE NO. 1494

TRANSCRIPT OF HEARING

DEARNLEY - MEIER & ASSOCIATES
GENERAL LAW REPORTERS
ALBUQUERQUE - NEW MEXICO
Phone CHapel 3-6691

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IN THE MATTER OF:

CASE NO. 1494 Application of Sinclair Oil and Gas Company for a non-standard gas proration unit. Applicant, in the above-styled cause, seeks an order authorizing the establishment of a 280-acre non-standard gas proration unit in the Eumont Gas Pool consisting of the W/2 E/2, E/2 NW/4, and NW/4 NW/4 of Section 19, Township 21 South, Range 36 East, Lea County, New Mexico, said unit to be dedicated to the applicant's Sinclair State 176 Well No. 3, located 2310 feet from the South line and 1650 feet from the East line of said Section 19.

BEFORE:

Mr. Elvis A. Utz

T R A N S C R I P T O F P R O C E E D I N G S

MR. UTZ: The hearing will come to order, please. The first case on the docket will be Case 1494.

MR. PAYNE: Application of Sinclair Oil and Gas Company for a non-standard gas proration unit.

MR. RUSSELL: William Russell for Sinclair Oil and Gas Company. I have one witness, Mr. Examiner, Mr. Richard M. Anderson. (Witness sworn in).

MR. RUSSELL: Before proceeding further, Mr. Examiner, we

request permission to amend our application for a non-standard gas proration unit embracing in our application 280 acres, to change that to read embracing 275 acres by reason of an acreage deficiency located in the northwest quarter of the northwest quarter of this Section 19, Township 21 South, Range 36 East, Lea County, New Mexico, which contains 35 acres rather than 40 acres.

MR. UTZ: Is that 275 acres even?

MR. ANDERSON: Yes, sir.

MR. UTZ: Is there any objection to the amendment of Sinclair's application to read 275-acre non-standard unit rather than 280?

(No response).

MR. UTZ: None, it will be so amended.

RICHARD M. ANDERSON

called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. RUSSELL:

Q Mr. Anderson, will you state your name, please?

A Richard M. Anderson.

Q What is the position that you hold with Sinclair Oil and Gas Company?

A Senior Petroleum Engineer with Sinclair Oil and Gas Company, Midland Division Office in Texas.

Q Mr. Anderson, have you testified in hearings before this

Commission before?

A Yes sir, I have.

MR. RUSSELL: I will ask the Examiner if he will accept his qualifications.

MR. UTZ: His qualifications are acceptable.

Q (By Mr. Russell) Mr. Anderson, have you made a study of the Eumont Gas Pool in the vicinity of Sinclair's State Number 176 lease in Lea County, New Mexico?

A I have.

Q Now, have you prepared any exhibits relating to your study?

A Yes.

Q And in connection with this application?

A Yes, I have.

Q Will you please explain those exhibits to the Commission?

A Exhibit One is an ownership map in the vicinity of Sinclair's State 176 lease, Lea County, New Mexico. The range, section numbers, township and range are shown on this exhibit. I have placed a red outline around the proration units that are presently established in the immediate vicinity of this lease. I have circled with purple the gas wells to which those proration units are dedicated. I have further indicated with green those wells to which I will refer to in a later exhibit in a pressure study of the area. I have identified this as Exhibit One and will refer back to Exhibit One to locate the wells which I talk about on this exhibit.

In the east half of the east half of Section 19, we see a dashed red outline around that 160 acres and that is a proposed Eumont Gas Pool non-standard proration unit which will be operated by Standard of Texas. They have advised me that they are in the final stages of pooling and unitizing that 160 acres with Pacific Western, who owns the north 40 acres. I might also state that the Sinclair State 176 lease is colored in yellow on this exhibit for identification purposes.

You will note from this exhibit that all of the acreage offsetting the proposed 115 acre addition to the present 160 acre non-standard unit that we have is offset by dedicated acreage in all directions. It is in effect oil acreage in the Eumont Gas Pool. The gas wells offsetting the proposed 115-acre addition are rather prolific gas wells producing from the Eumont Gas Pool.

I believe that the development in the area shown on this exhibit indicates that all of the acreage on this Sinclair State 176 lease may reasonably be assumed to be productive of gas from the Eumont Gas Pool.

Exhibit Two is a well location plat which was prepared to show the exact location of all of the wells on the lease. This reflects that the lease is operated by Sinclair and that the working interests are owned by four oil companies, 25 per cent each to Sinclair, Phillips, Skelly and Ohio; that Sinclair operates this acreage by virtue of an operating agreement with those working interest owners; the royalty under the entire 275 acres is common.

This exhibit also shows that the length and width of the proposed unit does not exceed five thousand two hundred and eighty feet and that the entire unit is contained within a single governmental section.

Exhibit Three is a schematic cross section showing all of the wells on the subject lease as well as a Shell State "H" Well Number One to the Northwest and Continental's Lockhart "A30" Number One to the Southeast. The two other wells which are located, which are the first well and the last well on the cross section, were merely put on there because there were electric logs or gamma ray neutron logs available on those wells and formation tops could be definitely ascertained on those wells. The Sinclair Wells were drilled in 1936 and with the exception of Well Number Three, which had a recent work-over in 1955, the wells have not had logs run on them and the formation tops as shown on this exhibit are from sample log peaks. Whenever the top is questionable but if we could make some determination of it, we have indicated the questionable top with an asterisk. Whenever we couldn't pick the top at all, we indicated a point on the schematic cross section where we felt it could be, but we did not place a subsidy footage reading opposite the point showing that it is strictly an estimation.

The gas well on the Sinclair lease is Well Number Three. It is the well that was circled in red on Exhibit Number Two and the formation tops on that well were picked from the gamma ray neutron survey and are considered very reliable and these tops,

incidentally, are the tops, the particular tops that were agreed upon by the industry study of this area and are those tops that were used in preparing the existing cross sections of the Eumont Gas Pool.

From this schematic cross section, in studying the pool in this particular vicinity, it appears like the gas oil contact is somewhere between minus 163 feet and minus 185 feet. The lowest most perforation in the gas well is minus 163 and the highest oil well perforation is at minus 185, so the gas oil contact lies somewhere between those limits, I believe. We can see from this exhibit that the Yates and Seven Rivers formations overlay all of the forty acre tracts in the proposed two hundred seventy-five acre proration unit and that we do have a well on every forty acres and we do have some basis for determining the tops.

Exhibit Number Four is a pressure history decline curve on which I have plotted the available pressure data on the eleven wells that were marked in green on Exhibit One. Those wells completely surround the proposed two hundred and seventy-five acre non-standard unit with the exception of to the west and we have no gas pool shut-in pressure on that well.

I might say the triangular points or bottom hole pressure which was measured by an instrument and the solid round dots are surface pressures which I corrected to subsea datum, but arbitrarily adding twenty-five pounds on the surface pressure unit. I was justified in doing this when I ascertained from the New Mexico Oil and Gas Committee Reports that these particular wells

are all reported to be free of water or distillate so I felt it would be just a dry gas well operating and I arbitrarily added twenty-five pounds to those pressures.

After incorporating this exhibit and running off the prints, subsequent investigation revealed that the bottom hole pressure points plotted on here are probably oil wells in the Eumont Gas Pool instead of gas wells. The round solid dots are gas well surface pressures but the triangular points are on dual completion wells and that's how we picked them up in the first place and reported them in the Eumont Gas Pool on wells that were dually completed in the oil zone and I feel sure that the triangular points are the pressures in the oil zone where the round dots are pressures in the gas cap higher up in the formation. However, I felt they were of some interest so by qualifying the exhibit in this manner, I left them on there for your information.

This reflects there is very little decline. It appears to me that there is very little presented in the points, which indicates to me very good pressure communication throughout this area and vicinity of our lease and indicates to me that a well will drain a larger area in the vicinity of our lease.

Looking at the last points that I have plotted on the right of the exhibit for the year 1957, I have further analyzed those points by tabulating them on Exhibit Five. The top half of Exhibit Five is pressure cumulative analysis and I have listed the eleven wells identified in green and the eleven wells that are

plotted for the year 1957 at the right hand side of Exhibit Four. I have listed those eleven points in order of increase in pressure in top half of Exhibit Five and I would anticipate that if a well were affecting only a small area, were draining only a small area, that when I tabulated cumulative recoveries as of the time these pressures in 1957 were taken, that the wells with the lowest pressure would have the highest cumulative recovery and conversely, the wells with the highest pressure would have the lowest cumulative recovery if that condition were true. On the other hand, if a well were to go through a larger area in this region, then I would expect to find no correlation between cumulative recovery and shut-in pressure and I will say that that is exactly what I found, that there is no correlation between cumulative recovery and pressure. We see that the well with the lowest pressure at the top of the list has least cumulative recovery than the well with the well with the highest pressure at the bottom of the list. We also find that several of the wells on the bottom of the list, the last have very high cumulative recoveries. The Continental Lockhart "A18" Number One had a shut-in pressure at that time of 196 pounds and its produced almost eleven billion cubic feet of gas.

So from that pressure cumulative analysis, I have come to the conclusion that a well will drain a larger area.

Then I went a step further in the bottom half of Exhibit Five and I thought if a well drained through a larger area, then

the cumulative recoveries should be directly proportional to the age of the well and I found that to be true. I have listed the wells again, the same eleven wells, this time in order of their age, the oldest well being first, and incidentally, I went back in the committee reports and I couldn't find Continental Lockhart "A18" Number One prior to 1953. However, in 1953, the first year they reported that well under that name, they showed it as having a considerable cumulative recovery and I just assumed from that that that well had been producing a long time. On all of the other wells, I was able to find the month of first production from the reports and have listed them in order, and in looking down the cumulative column, we find an cumulative decrease as the wells become newer.

We have that abnormally so in the list and so I have shown the acreage assigned being in that pool, the allowables proportional to the acreage assigned and we find that the fifth well, Humble Number One, which apparently is not in order incumulative in this analysis. You would expect it to be higher but the reason it isn't is because it only has eighty acres as reflected to some of the other wells in the list, but --

Q Mr. Anderson, could you state whether or not in your opinion the granting of this application would be in the interest of conservation?

A Yes, I believe that granting of this application would be in the interest of conservation and that it would prevent waste.

Q Mr. Anderson, would you state whether or not in your opinion the granting of this application would or would not violate the protection of correlative rights?

A As oil operators off-setting this property of this acreage dedicated to a gas well at this time with the exception of Standard of Texas, which is presently putting their unit together, I believe that the denial of the application certainly violates Sinclair's correlative rights and that it would prevent us from recovering our fair share of the hydrocarbon under this lease and the granting of this application would in no way impair the correlative right of the other operators on the pool.

Q Do you have anything further to add, Mr. Anderson?

A No, I have nothing further.

MR. RUSSELL: Mr. Examiner, that concluded our presentation of our application. If you have any questions you would like to ask, you are welcome to do so.

MR. UTZ: Yes, there may be some questions. Does anyone have any questions of the witness?

CROSS EXAMINATION

BY MR. PAYNE:

Q Mr. Anderson, you have prepared a contour map showing the gas oil contact in the area, have you?

A No sir, I have not. I believe that information as regards to a particular lease is available from my Exhibit Three, which was my schematic cross section.

MR. UTZ: Any other questions of the witness?

(No response).

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Anderson, how close is this well to the east boundary from your proposed unit?

A Three hundred and thirty feet.

Q What is the greatest distance that you will have to drain in order to drain in your acreage?

A That would be a diagonal. Would you like me to calculate that for you?

Q No, just a rough estimate. It wouldn't be too far from that ¹⁹⁸⁰ ~~two hundred and eighty~~ feet, would it?

A Yes sir, it would. If my measurement is right, it would be in the vicinity of four thousand six hundred and twenty feet.

Q Which well do you feel is going to drain the acreage from this well?

A I believe that Shell State "C" Well Number Two, which is the well in Section 24, Township 21, Range 35 East, will have some effect on this acreage as well as the Drilling and Exploration Company's State "F" Well Number Three, which ~~offsets~~ the acreage to the south. I also believe that Continentals Lockhart "A" Well Number Three, located in Section 18 to the North, is somewhat closer to this acreage, to some of this acreage, than our producing well.

Q Is that Eumont Well Number Three?

A I am having a little difficulty reading the number. The well is located, that I am referring to, in the Northeast of the Southwest of Section 18, twenty-one thirty-six.

Q Yes, sir. In other words, you are going to have to depend on counter-draining to a large extent?

A Yes sir, I am satisfied that all drainage in any area is offset by counter-drainage and as long as the allocation formula achieves some equitable distribution of the allowable in the region to the reserves, I believe that everybody's correlative rights will be protected to that extent, and I do not believe that the granting of this application will violate the correlative rights of any of the operators and certainly the denial from the drainage and counter-drainage standpoint will violate Sinclair's correlative rights and that our reserves will be drained by other companies.

Q You feel that the equalization of pressure in this pool is rapid enough to allow you to recover your proper amount of gas from the pool for this amount of acreage?

A The wells in this immediate area are very good wells, indicating good permeability in the area. Our well originally protentialed about eleven million feet per day open flow capacity. In a recent test, that was in excess of six million. And with those kinds of open flow capacities, I would say that the pressure communication is excellent in the area and I believe that our well will recover our ^{fair} ~~first~~ share of the hydrocarbons in this area if the application is granted.

Q Isn't that the only way that you are going to get your share of the hydrocarbon?

A Yes, sir.

Q Mr. Anderson, can you give me a comparison of allowables versus production for this well to indicate toward the end that this well will produce its allowable rather than to become a marginal well? Do you have monthly production figures available?

A No sir, I did not prepare a production history on the well and that the actual production of the well is subject to the pipeline's operating practices and I satisfied myself that we had a very able well and a well that was more than capable of producing the two hundred and sixty-five acre allowable at this time and I did not prepare the production data. However, I could submit that data to you.

Q Do you have the deliverability of this well available?

A The latest deliverability that was run in the well in file with the Commission is dated January 31, 1956. At that time-- I'm sorry, that was a back-pressure test. The absolute open flow at that time was eleven million seven hundred thousand.

Q When was this six million AOF taken?

A That was taken approximately thirty days ago and I received the report for the results and it was given to me in rough form in excess of six million open flow capacity as of approximately thirty days ago and I just had them run that special test to satisfy myself that the well was still a very able and

capable well.

Q Do you have that test at hand?

A No sir, I don't.

Q What is the absolute open-flow test you have there?

A I have a back-pressure test. The latest one is September 30, 1956 and the absolute open-flow was five million four hundred and ninety-one thousand.

Q I would be more interested in what was the volume rate of flow rather --

A I see.

Q And the pipeline pressure at which the flow was made.

A I will give you four pressures and four rates of flow that go with them. Would that satisfy you?

Q Well, first of all: this well tied to an intermediate system, high pressure system or what?

A It is connected to the Permian Basin Pipeline System.

Q High pressure system. It is a pressure in the vicinity of five hundred pounds. Why don't you just pick the flow there in the neighborhood of five hundred pounds?

A The highest flow that was tested September 30, 1956 was against four hundred and eighty-nine point two pounds absolute and the rate of flow was three million two hundred and thirty-two cubic feet per day.

Q I think that indicates the well will make its allowable.

Referring to your Exhibit Number Three, I note that as

far as the nomenclature on that exhibit, that you have squeezed off the perforation in the bottom of the hole. Can you tell me why those are squeezed?

A Yes, sir. Initially, the first work-over was December 14, 1957 when the well was plugged back from 3950 feet to 3925 feet in an effort to shut off water. We used seventeen sacks but it was unsuccessful. The average production after that plug-back was one thousand one hundred seventy-five barrels of water and seventeen barrels of oil for twenty-four hours. It was not a commercial producer and the well was further plugged back to 3872 and the seven-inch casing was perforated at 3872 up inside the casing so the reason that that well was plugged back was to shut off water.

Q The well there is a dry gas well, you stated?

A Yes sir, so there is no distillate or water.

Q There won't be any gas oil contact, will there? If you plug off the oil perforation to shut off water, you also shut off oil, do you not?

A Yes, I do not believe that the well is presently open below the gas oil contact. Otherwise, I believe we would have some oil in our production.

Q If there is any oil or water producing in that, there would be some question as to whether there is any oil at all or not, wouldn't it?

A Except for the production of the offsetting wells which

are producing from comparable intervals.

Q Now, one last point. Referring to your Exhibit Number Four, I believe you stated that you arbitrarily added twenty-five pounds to your surface pressure?

A Yes, sir.

Q Did you actually use an arbitrary figure or did you calculate that figure by some method?

A I calculated it by assuming a dry gas grade quantity of .007 pounds per foot, more or less. I believe that grade quantity by 3600 feet will calculate out close to twenty-five pounds, so I arbitrarily then took twenty-five pounds and felt that it was a reasonable amount to use.

Q Did you attempt to calculate the rest of the column from the approved New Mexico method in the back-pressure manual?

A No, sir. I might state, however, that I made the same correction on every well, so that all of the points on Exhibit Four would be in the same relative position to each other regardless of the calculation and that those surface pressures do not vary much in --

Q Did you calculate to certain datum on each well, for bottom hole or middle of the pay or --

A No sir, I attempted to use the datum of minus two hundred and fifty feet. However, I didn't feel that the number of pounds involved in making the correction was so arbitrary. I didn't feel justified in treating each well as an individual well, like in the

event I had a flood column with an appreciable amount of difference. So in this case, I felt the difference would be so slight that it would not justify my going to that extreme.

MR. UTZ: There probably wouldn't have been. However, I would like to have people in a habit of using the manual that we have prescribed. Are there any other questions?

MR. PAYNE: Mr. Russell, do you want to introduce your exhibits in evidence?

MR. RUSSELL: Yes, we are putting them in. Have you got those exhibits marked?

MR. UTZ: I have them marked, yes. Without objection, they will be accepted. There will be Exhibits One through Five.

Are there any other statements in this case?

(No response).

MR. UTZ: If not, the case will be taken under advisement.

(Witness excused).

