BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
August 29, 1962

EXAMINER HEARING

IN THE MATTER OF:

Application of Sinclair Oil & Gas Company for an order establishing special rules and regulations for the Medicine Rock-Devonian Pool, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order establishing special rules and regulations for the Medicine Rock-Devonian Pool, Lea County, New Mexico, to include provisions for 80-acre oil proration units therein. CASE 2625

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

MR. NUTTER: Call next Case 2625.

MR. DURRETT: Application of Sinclair Oil & Gas Company for an order establishing special rules and regulations for the Medicine Rock-Devonian Pool, Lea County, New Mexico.

MR. WHITE: If the Examiner please, Charles White of Gilbert, White and Gilbert, appearing on behalf of the Applicant. We have one witness to be sworn.

(Witness sworn.)

(Whereupon, Applicant's Exhibits Nos. 1 through 8 marked for identification.)

DOUGLAS W. CUNNINGHAM

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

DIRECT EXAMINATION

BY MR. WHITE:

Q Mr. Cunningham, will you state your full name for the record, please?

A My name is Douglas W. Cunningham.

Q By whom are you employed and in what capacity?

A I am employed by Sinclair Oil and Gas Company as a petroleum engineer.

Q Have you previously testified before the Commission or the Examiner as a petroleum engineer?

A Yes, I have.

Q Have your qualifications been accepted?

A Yes, they have.

Q Are you familiar with the subject application?

A Yes, sir.

Q Will you briefly state what Sinclair is seeking?

A We are seeking 80-acre proration units for the Medicine Rock-Devonian Pool with 80-acre allowables. The 80-acre proration units would consist of any two contiguous quarter quarter sections in any single governmental section, and we would seek the permission to drill the well on either quarter quarter section within 150 feet of the center of that quarter quarter section.

Q Would you refer to what has been marked Exhibit 1 and describe that lease ownership plat?

A Yes, sir. Exhibit No. 1 shows the general area of the present limits of the Medicine Rock-Devonian Pool. It shows that there are seven producing wells and there are two dry holes which have penetrated the Devonian formation. The two dry holes, one being Argo No. 1 W. R. Tomlinson in Section 14 of Township 15 South, Range 38 East. The other Devonian dry hole is Gulf's Clara M. Roberts located in Section 26, Township 15 South, Range 38 East.

I might point out that the Reed Estate No. 2 Well shown in the Southeast Quarter of Section 22 is currently being completed. I would point out that Section 22 is shown to be fully Sinclair operated. Sinclair does operate this, but it was a drilling unit. There are other working interest owners in this thing, and in the past we have had a hearing for L.A.C.T. installation on this unit and the Commission at that time was furnished ownership.

Q Are there other operators in the Pool?

A Yes, sir. Atlantic has one well, the F. B. Graham in the Southeast Quarter of Section 15. Tri-Service Drilling Company has one well, the W. R. Tomlinson No. 1 in Section 14; and Jack L. Hamon has the No. 1 Clara M. Roberts in Section 23.

Q Now will you refer to Exhibit 2 and explain the structural map?

A Exhibit No. 2 is a structure map of the Devonian reservoir.

Q What is this information based upon?

A It is based upon the completion data that we got off the logs here on the seven producing wells and the two dry holes, which all penetrated the Devonian formation. The contour interval is 50 feet. We show the oil-water contact at minus 9060.

Q How did you arrive at the oil-water contact from that data?

A The oil-water contact is based on the production data that we have obtained from the seven producing wells. All the wells which have been completed above a subsea depth of 9060 on initial completion made no water. The wells which were completed with perforations below 9060 did make some water.

Q What is the significance of the well location marking in the Southeast Quarter of Section 15?

A That open circle, the uncolored circle there to which Mr. White is referring is an old location. It could well have been rubbed out. I understand it will not be drilled. The old location was made sometime during 1961 by Texaco.

Q Will you explain the dashed line on the west side of the plat, or the left side?

A The dashed line represents what is possibly a fault. It could well be a steep dip. Some configuration is required in there, based on the regional geology of this area. We don't have any definite proof of either the steep dip or possible fault. None of the wells that have penetrated the Devonian so far have reflected

any such possibilities.

Q Where is the closest pool and what is its name and location?

A I believe that the closest pool is the South Denton Pool, which is approximately four miles southwest of this field. The Denton-Devonian Pool is approximately five miles northwest of this pool.

Q Will you refer to Exhibit 3 and describe your structural exhibit?

A This exhibit is quite bulky. It was necessitated by the fact that we had to use the small scale logs here, and if we shot them down any further we probably couldn't have read them. The cross section line is shown on the little small map territory here from A to A^1, it reads from left to right on the cross section itself. It starts with Argo's dry hole, the Tomlinson No. 1, and comes across the field down the center of the structure and down to A^1, which is the Gulf dry hole, Clara M. Roberts C No. 1. There are a few minor errors that I should like to point out to the Commission.

The completion data on the Argo Tomlinson No. 1 shows the drillstem test recovering 91/2 BA and it should be "BF" and stands for barrels of fluid.

The completion data on Atlantic's No. 1 was actually completed 7-12-60 instead of 7-11-62, and on Sinclair's C. S. Stone No. 1, which is the fifth well from the left side, the initial

potential should have been 453 and not 456. And tne completion data on the Reed Estate No. 1, the sixth well from the left side, the small foot sign after the 414 has no significance. That's supposed to be I.P.F. 414 barrels of oil.

There's one other small error that was possibly caused by drafting. If you look close at the oil-water contact, which was supposed to be at minus 9060, it bends slightly upward on the C. S. Stone No. 2. That should be a perfectly straight line and perfectly level.

This cross section was supposed to have been all wells referred to a datum of 7778, and I kind of think possibly that the log slipped down before we got them shot there, and these lines were put on there a little bit crooked. I don't think it detracts from the depicting of the structure.

We will notice that the Mississippian thickness and the Woodford thickness directly overlying the Devonian are uniform in each direction, as shown on this cross section. The amount of Devonian penetrated by each well is shown on this section, shown on our C. S. Stone No. 1 -- Sinclair C. S. Stone No. 1 penetrated the most section of the Devonian and this perforated the lowest in the Devonian section.

Q Now will you give the well completion data and in so doing, refer to Exhibit No. 4?

A Yes, sir. Exhibit No. 4 is a tabulation of the well completion data on all the wells that are in the field, including

Argo's dry hole and Gulf's dry hole. Starting at the left of the page, we have Operator, Lease Name and Well Number, and then the Elevation and the Total Depth, the Oil String Size and Setting, and then the Completion Interval both subsurface and subsea, and then the Treatment or the stimulation that the well was given, and the Initial Potential data and the Completion Date.

You will note that the Reed Estate No. 2 shown for Sinclair, we had set the oil string on it and we are currently completing the well. It has not been potentialed at this time, or at least it hadn't when I left Midland.

MR. NUTTER: Is that well going to be a producer, however?

A We have indications that the well will be a producer, but it will be marginal. It will not make top allowable. The latest test that I saw on it I think was 27 barrels of oil and 90 percent water, or something like that, or possibly more water. That's my best recall. I don't actually remember, but it does make a considerable amount of water.

Q Will you give the past production data as shown on your Exhibit No. 5?

A Yes, Exhibit No. 5 is just a tabulation of the production data. I did put this production data to the end of July, and when I made this table, the C-115's for July were not in, so I called our District Office and got our production data which they had already got off their gauge sheets, so that our monthly production for July will be reflected by the C-115's. I calculated the

Atlantic production here of 4600 barrels. I just took the number of producing days it should have produced and multiplied by top allowable, which was 230. I calculated their gas, also. I called a representative of Jack Hamon and he gave me the total production for June and July from his well of 6424. He also told me what the average production rate during July was. I therefore multiplied the average production rate by the number of days in July to get the 3860 for the barrels of oil we show there, and I multiplied that number of barrels of oil by the gas-oil ratio they had reported to get their gas, and then subtracted those two figures from the total figures to go back to June's production.

Tri-Service, I called them and got their well data, which their well was completed in the middle of July sometime, and they produced 1633 barrels up to August the 1st. So that the last month there, some of the data shown there is calculated by myself.

Q The exhibit is otherwise self-explanatory?

A Yes, sir.

Q Will you explain your graph as shown on Exhibit 6?

A Yes, sir, Exhibit 6 is a graph of the production data which we just saw on Exhibit 4 here. However, the graph does have two additions. I put on the number of producing wells; it shows that in July we had seven, and the curve, it reflects in which month the producing wells were added. And I put on a curve of bottom-hole pressure. The first pressure is at or about what I consider

the original bottomhole pressure for the Medicine Rock-Devonian Pool of approximately 4950, that is a bomb pressure. That comes from one well, the discovery well, Sinclair's C. S. Stone No. 1. The pressure was taken on 8-6-61 after a 120-3/4 hour shutin. In other words, a little over five days. The well had been produced only four days at the time that pressure was taken, and the actual pressure recorded was 4888, and we have corrected it to a datum of minus 9,000 feet for pressure recording of that datum of 4941.

MR. NUTTER: What was your datum?

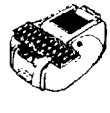
A Minus 9,000.

MR. NUTTER: 9,000 even?

A Yes. That is approximately the middle of the penetrated Devonian, approximately the middle of the Devonian penetrated by our Stone No. 1.

We next read a pressure nine days later on 8-15-61 when we took a bottomhole fluid sample from our Stone No. 1, the well had been shut in 48 hours, and recorded a pressure of 4895, which was corrected to the subsea datum of 9,000 for 4947. That's the reason that I have called the original bottomhole pressure somewhere around 4950. Both those pressures were read within nine days of each other. That's the first pressure that is recorded in July on the bottomhole pressure graph on this Exhibit No. 6.

Then the next point was recorded on February 4, 1962 in the C. S. Stone No. 2. The C. S. Stone No. 2 was completed the



29th of January, so that was shortly after the Stone No. 2 was completed that the pressure was recorded there. After a 53-1/2 hour shutin at 9,000 feet we read 4757, or a reduction of almost 200 pounds since the pressure was originally recorded in the C. S. Stone No. 1.

The next pressure point is actually the arithmetic average of static pressures read when we started an interference test which I'll come to in a minute in the exhibits. I think the arithmetic average, as I've shown here, may possibly be a little bit below what the actual pressure at that time was. However, I went ahead and graphed it on the Exhibit 6 as just the arithmetic average, which is 4746 and would only represent a drop of 9 pounds since the pressure in the C. S. Stone was recorded, the Stone No. 2, on 2-4-62.

Then the last pressure on the pressure curve there was recorded by one well August the 21st, 1962, Atlantic on their F. B. Graham No. 1 after a 96-hour shutin recorded 4635 referred to the datum of 9,000 feet, minus 9,000 feet, a drop of almost 300 pounds since the initial well was drilled in the field. Mr. Tomlinson did tell me this morning that the well was not fully built up and that it was still building. However, I think that is the approximate range of the bottomhole pressure during August. I think the pressure curve reflects that the entire reservoir is in excellent pressure communication.

Q Will you refer to Exhibit 7; explain your interference

test?

A Yes, sir. Exhibit No. 7 is a graph of an interference test that we ran starting on April 17th. Up in the right-hand corner the red line is the recorded by bomb static bottomhole pressure in the C. S. Stone No. 1. We see the red shaded area is the draw-down that was recorded in the well of approximately 30 pounds per square inch gauge. If you would refer back to the Exhibit No. 1, which is the land map of the area, at the time this interference test was run in the middle of April of 1962 there were only four wells in the field. They were Sinclair C. S. Stone Nos. 1, 2, and 3, and our Reed Estate No. 1. In order to prepare for the interference test, we shut all the wells in at 8:00 A.M. on April 14, 1962. Then we ran static bottomhole pressures on all four wells and we ran those with the same bomb, so that if there were any error in the bomb itself that all the pressures recorded would be relative to each other.

Q What is the spacing of these wells?

A These wells are all 1320 feet apart. When we read the static bottomhole pressures in those wells, in the Reed Estate No. 1 we read 4762, that's corrected to 9,000 foot pressure; and on the C. S. Stone No. 1 we read 4741; on the C. S. Stone No. 2, 4724; and on the C. S. Stone No. 3, 4764.

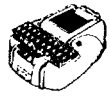
Q What does this signify, that there's communication?

A I would say that there is communication. They all read approximately the same pressure. They don't read exactly the same

pressures. Those four static pressures I just read on the first points recorded approximately the middle of the date of the 17th there. The green point is the static on the Reed Estate No. 1, the first blue point the static on the Stone No. 3, the first red is the static on the Stone No. 1, and the first yellow point the static on the Stone No. 2. We only opened the Stone No. 3 right at first. We planned later to open the other two wells; however, we were trying to make some reservoir calculations with relation to the distance to a possible fault that we showed on our structure map a while ago. We were going to record the pressure drawdown. We did that with the same bomb that we took the statics on the first four wells there, and we recorded these pressures shown in blue there.

The calculations were made, and we didn't have any indication of a fault being there, so we still say that it's completely possible that it could be but not probable, based on our calculations. After that well was flowed for about three days we took the bomb out of it and ran over and ran the bomb in the Stone No. 1 and recorded the build-up shown from about the middle of the 20th to the last part of the 21st there. Then we left the bomb in Stone No. 1 and opened up the Reed Estate No. 1 and the Stone No. 2 at a rate of 300 barrels per day each. This made three wells now flowing, the three wells surrounding the Stone No. 1; and then we recorded the 30 pounds drawdown in the well.

If we assume radial drainage in this reservoir, then



those wells are all draining a circle of radius 1320 feet. The area inside a circle with a radius of 1320 feet is 126 acres. We therefore feel that the wells are draining at least 126 acres. We think that, based on the way the pressure in the field has fallen, they are probably draining in excess of that.

Q Now will you refer to Exhibit 8? Explain the oil reserves and the economic data.

A Well, Exhibit 8 is the oil reserve and economic data for the Medicine Rock-Devonian Pool. Roman Numeral I, I have set down the data that I used in calculating the oil reserves for the entire field. I used an average effective porosity of 3.05 percent. This is read off the core analysis of our Sinclair Reed Estate Well No. 1. The gross porosity is slightly higher than that, but this is supposedly the porosity that is connected by permeability. The average connate water saturation of 30 percent I estimated from the core analysis on our Reed Estate No. 1. The formation volume factor of 1.4, that's a rounded-off figure from the reservoir fluid sample that we took on the Stone No. 1. Total reservoir gross volume is 64,510 acre-feet, which I obtained by planimetering gross pay isopach.

I estimated a recovery efficiency of 65 percent, which is a little bit high. I think this field will probably be, or will probably have a strong water drive as a producing mechanism. Some of the surrounding fields, the Denton, and I don't know exactly how far the Gladiola Field is away from this, but it's in the area, they

both have strong water drives, and I feel fairly sure that this field later in its life will exhibit a strong water drive. Therefore I estimated the original oil in place of 7,640,000 stock tank barrels; the estimated recoverable reserves of 65 percent, which is 4,960,000 stock tank barrels.

Then I went to Roman Numeral II and calculated the recoveries for the average field wells if the field was developed on 40 and 80-acre spacing. The productive acreage is 1183 acres, I obtained that from planimetering the gross pay isopach above the oil-water contact. Then if you develop that 1183 acres with one well to 80 acres, and drilled every one of them, you would have a possible 15 productive wells to be drilled. If you drilled it on 40, you would have approximately 30 productive wells to be drilled. So that the recovery on the average well on the 80-acre would be 330,000 stock tank barrels, and the recovery on the average well on 40 would be 165,000 stock tank barrels.

In Roman Numeral III, we come to the economics of 40 and 80-acre spacing. We see that over the life of this thing, the total cost for 80-acre is $534,890, and for 40-acre is $401,690.

That would give a net profit to the operator on 40 acres of $95,310; on 80-acre spacing of $459,110. That means we would only obtain $95,310, we would risk $268,490 drilling a well. That's on 40 acres.

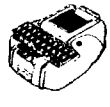
Q What were these well costs based upon?

A The costs of drilling equipment that I have used are based on our cost experience of our first four wells. It does include a pumping unit, which so far we haven't had to put a pumping unit on any of our wells, but I included one for a total cost of $19,400, based on a pumping unit that we ran on our T. D. Pope in the Denton Field, Devonian.

Q Based on your studies and the information reflected on the exhibits, is it your opinion that this pool can be economically drilled and drained on 80-acre proration unit?

A Yes, in my opinion 80-acre development will recover the exact amount of oil that 40-acre development would recover. 40-acre development would deplete the field quicker. We notice on Roman Numeral IV of Exhibit 8 that if we have to develop on 40 acres, it will require 15 additional wells that we would not need on 80-acre spacing, making a total cost of the additional wells of approximately $4,000,000, which would have to be spent if we drilled on 80 acres. I did some additional calculation which I did not show on the exhibit. I calculated the number of feet of pay that would be required to pay out a 40-acre well. With the permission of the Commission, I'll just read that data to them.

Over the entire life of the field, as shown on Exhibit 8, the cost of a 40-acre well would be $401,690. The oil required to pay out that cost would be 133,000 stock tank barrels. In order to get 133,000 stock tank barrels, the average gross thickness of the well would need to be 43 feet; therefore, if you went to the



structure map and drew the contour which would be 9,017, or 43 feet above the oil-water contact at minus 9,060, you would see if you located a well on each 40 acres there and on that map there probably would be 12 wells on 40-acre spacing drilled. which would either lose money or break even.

Q What special rules and regulations are you requesting?

A We're requesting 80-acre allowables, 80-acre proration units. The proration unit would consist of any two contiguous quarter quarter sections in the same governmental section, and we're requesting permission to drill a well on either 40 of the quarter quarter section within 150 feet of the center of that quarter quarter section.

Q Will any correlative rights be impaired by the proposed rules?

A No, sir, I don't think so.

Q Were these exhibits prepared by you or under your direction and supervision?

A Yes, sir, they certainly were.

Q Does that complete your testimony?

A It does.

MR. WHITE: At this time we offer Exhibits 1 through 8.

MR. NUTTER: Sinclair's Exhibits 1 through 8 will be admitted in evidence.

(Whereupon, Applicant's Exhibits Nos. 1 through 8 entered in evidence.)

MR. NUTTER: Do you have anything further, Mr. White?

MR. WHITE: That's all we have.

MR. NUTTER: We will recess the hearing until 1:30, at which time we will ask Mr. Cunningham a couple of questions.

(Whereupon, the hearing was recessed at 12:00 o'clock.)

* * * * *

AFTERNOON SESSION

(Whereupon, the hearing was resumed at 1:30 o'clock P.M.)

MR. NUTTER: The hearing will come to order, please. Does anyone have any questions of Mr. Cunningham?

MR. MONTGOMERY: I do, Mr. Nutter.

MR. NUTTER: Mr. Montgomery.

CROSS EXAMINATION

BY MR. MONTGOMERY:

Q Mr. Cunningham, are there any wells in this field that are located 330 from the property line?

A Yes, Tri-Service W. R. Tomlinson in Section 14, and J. L. Hamon in Section 23 are all 330 from the property lines.

Q It's my understanding that the proposed pool orders call for the well to be 150 foot from the center, is that correct?

A Yes.

Q Would you state what the royalty is in Section 21?

A Section 21?

Q Yes, sir.

A You mean who owns the royalty?

Q Yes, sir.

A I suppose the State does, that's what my map shows.

Q Most all the other acreage in the pool would be patented land?

A Well, I see the State owns partly in Section 15 and also in Section 27.

Q If Sinclair should drill another well in this field, where do you think the location would be?

A They have proposed a location directly north of our C. S. Stone No. 3. However, I do not know whether the well will be drilled or not. We have not definitely decided to drill or not drill the well. It's in the state of flux. We also have several locations open in the Southwest Quarter there that show the B. D. Buckley royalty. A well might possibly be drilled there. I can't say for sure at this time.

Q Would you have any strong objection to the order following the State-wide rule, as far as spacing is concerned?

A I don't know whether our company would have any strong objection at this time or not. We would have to discuss it with our top management. The rules that we have proposed are what we have thought would be fair in this field, and right now we would stick to the same proposal that we made.

MR. MONTGOMERY: That's all the questions I have.

MR. NUTTER: Any other questions?

BY MR. NUTTER:

Q Mr. Cunningham, referring to your Exhibit No. 2, which is the structure map of this field, what primarily is that structure map based on?

A It's based on the control that we have from the wells that have penetrated the Devonian, seven producing wells and two dry holes there. Also that Reed No. 2 is through the Devonian already.

Q Now prior to drilling the first well in here, does Sinclair have a seismic picture of the structure?

A Yes, sir, it was shot by seismic.

Q Does that seismic picture, is it confirmed by what you've found in drilling these wells?

A The seismic high wasn't just exactly where our No. 1 has found it, but in general it is almost the same.

Q What is the fault based on?

A The fault was put in there and by the way, we put it in as a dashed line because we aren't at all certain that it is a fault. It could be steep dip. It is from regional interpretation there. The seismic map did show the elevational changes there, or the subsurface changes. In other words, over in Section 16 there and to the west, there, is lower than over around Section 22 and 15.

Q By the seismic?

A By seismic.

Q Actually the westerly-most well, which is the No. 3 Stone, is a high well as far as the structure is concerned, isn't it?

A Yes, sir. It topped the Devonian at 8955.

Q I presume in making your economic evaluation as on Exhibit 8 where you planimetered the gross pay isopach, you were using the same structure you had here?

A Yes, sir, I did, and I stopped at that fault, that dashed line.

Q So you figured the volume of the reserves, based on the contours and over to the fault and down to an assumed water-oil contact of 9060?

A Yes, sir, I sure did.

Q Are any of these wells dually completed in any other zone, Mr. Cunningham?

A No, sir.

Q Is there any Pennsylvanian production indicated on any of the logs of the wells?

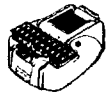
A Not that I'm familiar with, Mr. Nutter.

Q I notice on Exhibit No. 6 that in May, June, and July of 1962 there has been a rather marked increase in production of water in this pool. Is this due to water coming into any of the high wells, or is this due to completion of wells on the fringe of the pool which are completed lower?

A The predominant amount of that water is from our Stone No. 3. Sometime in June it started cutting a lot of water.

Q Its original completion was for water-free production?

A Yes, sir.



Q What's the percentage of water that it's making at the present time?

A Approximately 41 percent.

Q Of the total fluid is water?

A Yes, sir.

Q That was No. 3, you say?

A Yes, sir.

Q Is this on Exhibit No. 4 the completion interval, that by 9017 to 9037, is that the perforated interval in that well?

A In Stone No. 3 it is.

Q So it's actually above the 9060?

A Yes.

Q To what do you attribute the fact that the No. 3 is making considerable water at the present time; is it an indication of conning, in your opinion?

A I don't think it's probably caused by conning. I think if it were conning, that both the Reed Estate No. 1 and the C. S. Stone No. 1 and the C. S. Stone No. 2 should all be making like amounts of water, if it were due to conning. They are all in general completed in almost the same subseas. They aren't quite as low as that one, but that would be my reason for not attributing the water production from the Stone No. 3 to conning.

Q What do you attribute it to?

A I don't have an honest opinion as to the cause of that water. It might possibly be in flux, , maybe in a preferential

direction. It may be possible that instead of being bottom water that it's edge water and it's going to come from some direction. I note that in the Denton, water production usually starts on the south end first. We may have something like that going on here. We have not run any tests on the No. 3 to determine where the water could be coming from. I'm sure when it gets to where it will not make top allowable, we will probably run some tests on it to determine where the water is coming from and may possibly plug back the well and recomplete higner up in the Devonian.

Q There's no indication as yet that this is an edge water drive from the west, then?

A Not definitely, I'd say.

Q Now, Mr. Cunningham, your Exhibit No. 7, the interference test data, as I understand it, all of the wells were shut in on the 14th?

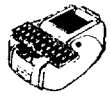
A Yes, sir.

Q And they remained shut in until the 17th, at which time the blue well, being the No. 3 Stone, was opened up?

A Yes, sir, that's correct.

Q And the pressures, the static pressures as measured in the three wells, or all four wells which are shut in, is indicated in the upper portion of the exhibit there, the 4762 pounds for Reed No. 1, 4741 for the Stone No. 1, 4724 for the Stone No. 2, and 4764 for the Stone No. 3?

A Yes, sir.



Q Actually these wells are drilled on an almost per 40-acre pattern, are they not?

A Yes. If you drilled all the wells in there on the place they are already on, it would be fully developed on 40's.

Q These three wells that remained shut in when the Stone No. 3 was opened up continued to increase in pressure up until the time they were opened on the 20th, is that right?

A The dashed lines there, Mr. Nutter, were not continuously recorded, and that is just my interpretation of probably what happened. The only two pressures that were measured on the Stone No. 2 are the initial static pressure, --

Q That's the yellow one, right?

A That's the yellow one, -- and the final fluid pressure.

Q Where is that final flowing pressure depicted on here?

A Well, you see the yellow line with the arrow pointing downward, there's a little note over here at the bottom right of the graph, the final flowing bottomhole pressure measured on the Stone No. 2 was 3966, which would have been off this graph. We did not measure --

Q So actually no static pressures were taken after the No. 3 well was opened up?

A Only on No. 1.

Q And that's the red well?

A Yes, sir.

Q So you've just dotted these in, assuming the other wells

built up in the same --

A To the same pressure.

Q -- to the same point that the No. 1 well had built up to?

A Yes. I don't necessarily say that that would be the path that the build-up took. It could go up right away, or it could have gone up not uniformly at all.

Q Was the Atlantic well to the north completed and in production at the time this interference test was made?

A No, sir. At the time this test was made there were only four wells in the field, and those are the four wells that the pressures were taken on.

Q Now on Exhibit No. 8, you have an average effective porosity of 3.05 percent?

A Yes, sir.

Q What did you include as porosity, Mr. Cunningham? What were your cut-off points for including it in the porosity computation?

A I didn't cut off anything in this computation. I took the core and went down to 9060, and I averaged every foot of the porosity that was shown on the core. In other words, some of these may have had permeability of less than one-tenth of a millidarcy. I did not cut those out of there. The core description depicts multiple random fracturing and vuggy porosity throughout this thing, and I think that probably there's very little inter-

crystalline and porosity and permeability in this reservoir.

Q How much core was taken from the well?

A I don't know. I have the footage here somewhere. I can tell you in just a minute. 158 feet.

Q Does that represent the entire productive interval of the Devonian in this structure, or --

A I think so, yes, sir.

Q And you get an average of 3.05 percent porosity by averaging each foot of the 158 feet that was cored?

A I only averaged down to 9060. That doesn't quite get the entire section on this Reed No. 1. The one that was cored, the gross section on there isn't the entire 158 feet. Some of the bottom of that core was left out.

Q That's below the oil-water contact?

A Yes, sir.

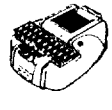
Q Is that the only well in the pool that has been cored, do you know?

A No, sir. Atlantic has cored their F. B. Graham No. 1 up there, but we did not get a copy of that core from Atlantic.

Q So you don't know what porosity was indicated in that well?

A I talked to Mr. Tomlinson with Atlantic one day over the phone, and he told me it averaged 3.5 percent, which is a little bit higher than I used on my data sheet.

Q And the 30 percent water saturation is taken from the



core analysis, too?

A Yes, sir.

Q Now this $268,000, that's your estimated cost of drilling and equipping a well?

A Yes, sir.

Q That did include the pumping unit?

A Yes, that includes $19,400 for a pumping unit.

Q What does the remainder of the $268,000 include? Is that an average of all of the wells that you've drilled?

A That's an average of our first four, Mr. Nutter, the average cost on our Stone 1, 2, and 3, and our Reed Estate No. 1.

Q What were the individual well costs there?

A I have that on a sheet of paper here somewhere. The Stone No. 1 cost $249,917, excluding a pumping unit and tank battery. They put in a tank battery, the first one cost $11,850. The Stone No. 2 cost $224,792, excluding the pumping equipment and tank battery. At the time they drilled that one, they added to the existing tank battery with an L.A.C.T. Unit, which cost $4588. The Stone No. 3 cost $336,922, excluding pumping equipment and tank battery. The Reed No. 1 cost $249,061, excluding pumping equipment and tank battery. At the time they drilled that Reed No. 1, they added $7,939 for some more tankage. That made the average cost of the well $249,090, and the tankage that had been put on the first four wells averaged $6,000 per well, approximately. Those are the costs that I included in that average cost of a well,

$6,000 for tankage and $19,000 for pumping unit, and the rest of it was drilling and equipping.

Q And the $6,000 per well for the tankage includes the automatic custody transfer that was installed?

A Yes, it does. I think subsequent wells on there probably wouldn't cost quite that much for additional tankage. We have two 1,000-barrel tanks and the L.A.C.T. will run approximately 300,000 barrels a day.

Q The actual well costs for the first four wells have been fairly representative of the average?

A I think so.

Q You haven't had any particularly high costs on any of them?

A No, they were right around the 249,000.

Q What was the average permeability, according to the core analysis?

A I didn't average it, Mr. Nutter. It ranged from less than one-hundredth of millidarcy to 777 millidarcys.

Q Without averaging, what did it look like most of it would be in the neighborhood of?

A I'd say between 80 and 100, somewhere in there.

MR. NUTTER: Thank you, Mr. Cunningham. Any further questions? The witness may be excused.

(Witness excused.)

MR. NUTTER: Do you have anything further, Mr. White?

MR. WHITE: That concludes it.

MR. NUTTER: Does anyone have anything they wish to offer in Case 2625? We will take the case under advisement.

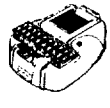
MR. MONTGOMERY: I would like to make a short statement, Mr. Examiner.

MR. NUTTER: Go ahead, Mr. Montgomery.

MR. MONTGOMERY: I am sorry I didn't get here sooner and I didn't have an opportunity to visit with Sinclair on the matter at all.

I am representing a very small working interest and also a leaseholder of acreage that is indicated to be productive on Exhibit No. 2. I certainly have no quarrel with 80-acre spacing. I want to point out to the Examiner that Section 21 is State land, I am the leaseholder. According to Sinclair's geologic information, whether it is correct or not, Mr. Cunningham left some question as to whether it was a fault or a steep dip, but I do suggest to the Examiner that he consider State-wide spacing in the event an order is written in lieu of the 150 feet from the center of a 40-acre tract. I point this out, that there are three wells that have been staked in this field on 330-acre spacing, and point out further that the State could conceivably suffer from loss of royalty in the event this tract was not permitted to be developed.

MR. NUTTER: Which three wells have been staked on the 330-foot locations?



MR. MONTGOMERY: The Tri-Service Johnson, the Jack L. Hamon Roberts, and the Texaco No. 1 Graham, located in Sections 14, 23, and 15 respectively.

MR. NUTTER: I believe the earlier testimony indicated that the Texaco well had never been spudded, however.

MR. MONTGOMERY: Yes.

MR. NUTTER: That it was an old location.

MR. MONTGOMERY: I don't believe the location has been withdrawn. It has been approved and hasn't been withdrawn to date.

MR. NUTTER: Anyone else?

MR. TOMLINSON: I am Phil Tomlinson. I represent Atlantic. We would like to concur with Sinclair's proposal for 80-acre spacing here. We have examined their data and conclude that each well can drain at least 80 acres.

MR. NUTTER: Does anyone else have anything they wish to offer in Case 2625? We'll take the case under advisement.

* * * *

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached transcript of proceedings was reported by me in stenotype and that the same was reduced to typewritten transcript under my personal supervision and contains a true and correct record of said proceedings, to the best of my knowledge, skill and ability.

WITNESS my hand and seal this 8th day of October, 1962, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Ada Dearnley
NOTARY PUBLIC

My Commission Expires:

June 19, 1963.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2625, heard by me on Aug 29, 1962.

, Examiner
New Mexico Oil Conservation Commission