BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

IN THE MATTER OF:

CASE 1722

TRANSCRIPT OF HEARING

JULY 16, 1959

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

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
JULY 16, 1959

IN THE MATTER OF:

CASE 1722 Application of Caulkins Oil Company for a triple completion. Applicant, in the above-styled cause, seeks an order authorizing it to triple complete its Breech Well No. PMD-224, located in the NE/4 NE/4 of Section 13, Township 26 North, Range 7 West, Rio Arriba County, New Mexico, in such a manner as to produce gas from the South Blanco-Pictured Cliffs Pool, gas from the Mesaverde formation, and gas from the Green-formation within the vertical limits of the Dakota Producing Interval through parallel strings of tubing.

BEFORE:

Gov. Burroughs
Murray Morgan
A. L. Porter

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

MR. PORTER: Take up next Case 1722.

MR. PAYNE: Application of Caulkins Oil Company for a triple completion.

MR. KELLAHIN: Jason Kellahin of Kellahin & Fox, Santa Fe, New Mexico, representing the applicant. Before we present our case, I would like to call one item to the attention of the Commission in regard to the advertising, at the time this case was advertised. It reads that we propose to produce gas from the

South Blanco Pitcured Cliffs Pool, gas from the Mesaverde formation, and gas from the Greenhorn formation within the vertical limits of the Dakota producing interval. We have treated the case as the Greenhorn being an undesignated pool in view of the fact that it does not, in our opinion, fall within the vertical limits of the Dakota. I don't believe that our presentation would go beyond the scope of advertising. In fact, it would be restricted, but that is probably an error in the advertising.

MR. PAYNE: Mr. Kellahin, isn't the Greenhorn formation within the vertical limits of the Dakota producing interval in the Dakota Order?

MR. KELLAHIN: It is my understanding that the Dakota is from the base of the Greenhorn to the depth of 400 feet below that point unless it has been changed since the last Order I looked at.

MR. PAYNE: In any event, the advertising would not mislead anybody.

MR. KELLAHIN: I donot feel it would. As a matter of fact, I think we are restricting our application rather than broadening it by treating the Greenhorn as a separate producing interval.

MR. PORTER: Didn't mislead the applicant.

MR. KELLAHIN: No, sir. As a matter of fact, we much prefer it be in the Dakota, it would simplify our problem.

We have one witness, Mr. Gray.

(Witness sworn)

FRANK GRAY,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Will you state your name, please?

A Frank Gray.

Q By whom are you employed and in what position, Mr.Gray?

A As field superintendent for Caulkins Oil Company, Farmington, New Mexico.

Q Have you previously testified before this Commission and had your qualifications accepted?

A Yes, sir.

MR. KELLAHIN: Are the witness' qualifications acceptable?

MR. PORTER: They are acceptable.

Q Mr. Gray, does the area involved in Case 1722 fall within the area which is under your supervision?

A Yes, sir.

Q Are you familiar with the application of Case 1722?

A Yes, sir.

Q Now, briefly, what does that application propose?

A That the -- we are applying for approval to complete this well to produce from the Pictured Cliffs,Mesaverde, and

Greenhorn formations through separate strings of tubing.

(Thereupon, Caulkins' Exhibit No. 1 was marked for identification.)

Q Now, referring to what has been marked as Exhibit No. 1, would you explain that Exhibit, please?

A Exhibit No. 1 is a plat showing the ownership of the acreage surrounding the section in which this well is located, and also the location of the well.

Q Now, what is the present status of the Caulkins Oil Company's PMD Well No. 224?

A It's presently producing from the Mesaverde, Point Lookout portion of the Mesaverde zone only; with the Pictured Cliffs formation shut-in, and also the Greenhorn shut-in.

(Thereupon, Caulkins' Exhibit No. 2 was marked for identification.)

Q Now, referring to Exhibit No. 2, would you explain that Exhibit, please?

A Exhibit No. 2 is a sketch showing the mechanical arrangement we propose to have if we are granted approval to make the triple completion as we described. It also shows the condition of the hole with respect to junk that was necessarily left in the well.

Q Now, would you first direct your attention to the proposed completion,and discuss that.

A In discussing the proposed completion, I would like to review the operation on the well that got the well into the condi-

tion that it is in.

Q You go ahead and explain the history of this well.

A This well was mud drilled to 3,000 feet at which depth 9 5/8 OD 40 LBJ 55 seamless casing was cemented at 2997 feet, with 300 sacks of cement. It was then gas drilled to a total depth of 7314, then mud drilled to 7342, this being approximately 80 feet into the Morrison formation. The drilling was finished on January 19, 1959. There was no water found between 3,000 feet and 7314. We did have gas entries indicated on a temperature log that was run at a depth of 7314, one of which was from the Greenhorn formation. 7 inch casing was run to 7342, then unscrewed and pulled from 2920, that's 2,920 feet, leaving 9 5/8 inch OD J-55 casing from zero to 2,920, and 7 inch OD 23 and 26 pound casing from 2920 to 7342.

The 7 inch liner left in the well was squeezed, cemented and tested satisfactorily after drilling out all cement to 7318 with 3200 pounds water pressure. A semitone survey was run, which showed cement behind the casing as follows: 7311 to 6351; 5398 to 3488; 3346 to 3310; 3,046 to 2719; 2602 to 2276, with possible cement from zero up to 1209 feet. The lower Dakota was then selectively perforated from 7,099 to 7,236. It was not perforated in a solid interval, just the indicated, or the zones that appeared to have the best possibilities. It was then fractured with 97,608 gallons of water and 80,000 pounds of 4060 sand, after which a Baker drillable magnesium plug was set at 7,050 feet. The upper

Dakota was then perforated from 7010 to 7030 and fractured with 20,000 pounds of 40/60 sand and 35,805 gallons of water. Baker plastic coated drillable magnesium bridge plug was then set at 6980. The Greenhorn formation from 6900 to 6940 was then perforated and fractured with 20,000 pounds of 40/60 sand, and 34,606 gallons of water. The Greenhorn formation was then unloaded and tested, and I don't have the exact time that we flowed this well, but it was for a period of days, couple or three days, and it would indicate it would make a small amount of oil and some half a million feet of gas. And after testing it, we set another plastic coated drillable magnesium bridge plug at 5130 and perforated the Point Lookout portion of the Mesaverde zone from 4996 to 5146, and this zone was fractured with one hundred thousand pounds of 20/40 sand and 58,862 gallons of water. The sand screened out when we had pumped 90,000 pounds into the sand, leaving about 10,000 pounds in the casing. So no drillable bridge plug was set between the Point Lookout and Pictured Cliffs, the sand serving as bridge plug. The Pictured Cliffs was then perforated from 2616 to 2754 and fractured with 50,000 pounds of 10/20 sand and 44,088 gallons of water. Sand left in the casing and the bridge plug at 5180 were drilled out. However, when the bit was cleaned out to a depth of 6874, the drill string hung up for no apparent reason. We were just in the regular process of drilling this material out and it just all of a sudden struck and we couldn't move it. And from February 20th, 1959 to March 13, 1959, we carried on a fishing

operation trying to retrieve this, the three drill collars and a bit that we finally had left in the hole; we had recovered the rest of the tubing, leaving that much material in the hole. We were up -- up to that time, we were using a small portable rig, and we weren't accomplishing anything, so we shut down until we could get the same rig back over the well that we used to drill it. And from April 15 to May 16, we fished and tried to get this junk out with no success. It might be of interest, the total bill for -- spent for fishing on this, trying to clean this thing out, amounted to about a hundred thousand dollars. The last, that is, from April 15 to May 16th, the fishing was supervised by Mr. W. T. Carroll. He is, I understand, the principle owner of Carl Oil Tools in Farmington, and I've known him for some fifteen years, and I know that he is a very capable man on this type of work, and it was his conclusion after fishing as long as we had, that our chance for getting it out were nill. And he finally concluded that he had definite information that for some reason or other the casing had collapsed around the three drill collar, and that is borne out more by the fact that we were able to move this fish forty-five feet. We did get hold of it and jarred it up the hole forty-five feet, but that is as far as it would come. It didn't move in some forty-eight hours of steady jarring, and so it was his conclusion that the pipe had collapsed and was squeezing the drill collars and bit, and when the bit moved up to where the pipe was collapsed, it stopped. And we attempted for quite a

long time to wash over the drill collars with cutright shoes. That's wash over shoes that are faced with a very hard material that is ordinarily used for that purpose. And we could mill through the tight place;you would pull the bit again, and it would start milling again in the same place, and that was repeated over and over again with no progress. So finally, after spending that much time on it, we decided that it was impossible to clean it up.

MR. PORTER: You spent about three months in all --

A Actually, it was about fifty-five or fifty-six days of actual time that we spent trying to clean it up. There were two different stages with it, one with the small rig, and then the 34, I believe it was 34 days with the larger rig. So we gave up the idea of trying to clean it up and ran Baker Oil Tools, Model D production packers, one to 5184 and one to 4954. These were run by Schlumberger Well Corporation on May 17, 1959.

2 inch tubing was then run to 6302 with six Baker seal nipples spaced to seal off in the Model D packer at 5184, and a Baker locater seal was set in the packer at 4954. An Otis side door choke was run in the string of tubing at 5153. Now, the first arrangement we had permitted the Greenhorn gas to flow, but excluded the Point Lookout. And the Greenhorn then was tested for five days. Starting May the 19th, it produced 544 MCF of gas, two and a half barrels of 51 gravity distillate. On the 20th, it was 504 MCF of gas, seven and a half barrels of distillate;

21st, 504 MCF gas, 6.68 barrels of distillate; May the 22nd, 544 MCF gas, 6.68 barrels of distillate; on the 23rd, 504 MCF gas, 6.68 barrels of distillate. Now, this test was through a high pressure separator operating at 100 pounds back pressure. The well was then shut-in until May 28, 1959, at which time a bottom hole pressure test was made. The Greenhorn pressure at 5150, was 1541 pounds gauged. A pressure gradient was established between 5,000 feet and 5153, at .106. So the calculated pressure at the top of the Greenhorn pay, using this gradient that would be at 6900 feet or minus 437 was 1727 pounds per square inch gauge after ninety-six hours of shut-in. Now, following this test, the Otis side door choke was pulled and run back and set to exclude the Greenhorn and permit the Mesaverde to produce. A bottom hole pressure test of the Mesaverde was made the next day, May 29, and its pressure was found to be 1,036 pounds, and it had been shut-in for two hundred and forty hours. A three-hour potential test of the Mesaverde was made June 1, 1959, and its rate of flow at the end of three hours through a three-quarter inch choke on 2 inch tubing was 2123 MCF. Its calculated open flow was 2233, so there was little restriction from the 2 inch tubing as calculated, well working pressure was 155 pounds per square inch absolute.

The Pictured Cliffs was shut-in during this test, and its pressure of 588 pounds was unchanged during the test, so no packer, no packer leakage of the upper packer was indicated on this test. A three-hour test of the Pictured Cliffs was made on June 8, 1959,

and its rate of flow at the end of the three-hour test through a three-quarter inch choke on one and a quarter inch choke was 3537 MCF per day.

It is observed the well head working pressure was 392 pounds per square inch absolute. The Mesaverde, shut-in pressure was 730 pounds, and it was not affected by this test, so no packer leakage of the upper packer was indicated at this time. Permission was obtained from the Oil Conservation Commission to produce the Mesaverde zone only on June 18, 1959, and we have a tabulation of its production to date which is our Exhibit No. 7, which shows that it probably will not produce more than five hundred thousand cubic feet of gas per day in the future. Now, from the record of the tests of the Greenhorn, it obviously will produce less than five hundred thousand cubic feet of gas per day, so we are dealing with rather small volumes of gas from both zones. Now, when packers and tubing were installed in this well, it had been planned to ask for permission to commingle the Mesaverde and Greenhorn. No reliable data was available at that time as to pressure or volume in either zone. We now know that substantial differences in bottom hole pressure do exist between the Greenhorn and Mesaverde. Further, one zone is prorated and one is not, so in order to permit the application of proration rules and regulations, permit presently unrestricted production from the Greenhorn, and to provide proper mechanics for taking packer leakage tests across both packers, we would like to propose, first, that the 2 inch tubing

now in the well be mechanically perforated just above the side door choke sitting nipple at 5153, that's in the 2 inch tubing string. Second, that the side door choke in the well be removed, then run back on 1 inch 1.68 pounds J-55 seamless tubing, this tubing to be of regular threads and couplings, and the side door choke to be reset in the sitting nipple provided for it in the 2 inch string of tubing.

MR. PORTER: Mr. Gray, what size tubing did you say?

A We would run the 1 inch tubing inside the 2 inch tubing.

MR. PORTER: Thank you.

A And the -- this side door choke would be adopted so that it would be screwed on to this 1 inch tubing and run on the end of the tubing string and then it would be set in the sitting nipple provided for it, and have the tubing and the couplings on the side door choke arranged so as to exclude the Mesaverde, and permit production from the Greenhorn. That would -- with that arrangement, the Greenhorn could flow through the 1 inch tubing, and the Mesaverde could flow through the space between the 1 inch and 2 inch. Suitable equipment would be installed on the well head surface to, surface equipment, to seal it off between the 2 inch and 1 inch, so the Greenhorn and Mesaverde production could be measured separately; a separator and storage tank will be installed to adequately care for the Greenhorn production. A separator and tank has already been installed to handle the Mesaverde production. That the purchaser be requested to install an

orifice meter to measure the Greenhorn gas production. That packer leakage tests be made. After making the proposed changes, these packer leakage tests can be made by producing the Greenhorn and the Pictured Cliffs simultaneously with the Mesaverde shut-in, we can observe the effect of producing those two zones on the pressure on the Mesaverde. Then, the packers would be tested in reverse order by shutting in the Pictured Cliffs and the Greenhorn, and flowing the Mesaverde. The shut-in pressure of the Mesaverde zone was 742 pounds, when the June 8th packer leakage test was made, and it's estimated the Greenhorn will produce less than four hundred thousand MCF per day against the 400 pounds average pressure carried on the purchaser's gathering system. The operating bottom hole pressure of the Greenhorn at that volume and line pressure would be a little over 500 pounds. A differential pressure of approximately 238 pounds per square inch absolute would exist across the lower packer with the Mesaverde shut-in and the Greenhorn producing. A leak across the packer at 5184 should be apparent if the well is tested in this manner.

Now, with the Mesaverde flowing and the Greenhorn shut-in, the pressure differential should be much greater, and a leakage across the packer at 5184 should be even more easily depicted. The operating bottom hole pressure of the Mesaverde when flowing five hundred thousand cubic feet per day through the two by one annulus should not be much different than when flowing through 2 inch tubing. Leaking tests would, therefore, be possible across

the upper packer at 4954.

Q Now, with this type of completion, can you make the deliverability tests required by the Commission?

A Yes, sir, I think we can comply with all the regulations of the Commission in that respect.

Q Now, directing your attention to this lower plug as shown on Exhibit No. 2, that is a magnesium bridge plug, is it not, the lower plug?

A The lower plug is a Baker magnesium bridge plug. It is what they previously called their standard bridge plug.

Q Now, is that type of plug subject to corrosion?

A Yes, sir, it is.

Q Are the Dakota perforations as shown on your Exhibit and your Graneros perforations as shown on your Exhibit within the common source of supply designated as Dakota by this Commission?

A Yes, sir, thatis within the 400-foot vertical limit of the Dakota zone.

Q Then, in the event there were leakage across that lower packer, would it be of any significance?

A No, sir, it would have -- be no different than any Dakota well completed in the same two zones and shut-in, which is done all over the Basin.

Q Now, directing your attention to the upper bridge plug set at 6980 feet, would you describe that plug?

A The plug at 6980 is a plastic coated Baker magnesium bridge plug. It differs from the one below in that it is plastic coated.

Q Do you have any information showing that that is the plug which was set at that point?

A Yes, sir, I have.

(Thereupon, Caulkin's Exhibit No. 3 was marked for identification.)

Q Referring to Exhibit No. 3, would you discuss that Exhibit, please?

A Exhibit No. 3 is an affidavit prepared by M. M. Mahaffey, who is the manager of Baker Oil Tools, Incorporated in Farmington, in which he identifies a 7 inch Baker plastic coated magnesium plug by serial number and states that it was sold to Schlumberger Well Surveying Corporation, , on February 4, 1959.

(Whereupon, Caulkins' Exhibit No. 4 was marked for identification.)

Q Now, then, referring to Exhibit No. 4, would you discuss that Exhibit?

A It's an affidavit prepared by R. E. Robinson, one of the engineers employed by Schlumberger Well Surveying Corporation. And the affidavit states that he set this particular plug, and it is identified by number, 6980 feet.

Q That plug was set on a wire line or how?

A That was -- as the affidavit states, these plugs were run in the well on a service wire line and set electrically after

using Schlumberger Depth Control procedure to make certain each plug was set at proper depth and not in a casing coupling.

Q Now, have you any information, Mr. Gray, which would show that the particular plug, the plastic coated plug, is not subject to corrosion?

A I have a technical report from Baker Oil Tools --

Q Has that been designated as Exhibit No. 5?

A That is Exhibit No. 5.

(Whereupon. Caulkins' Exhibit No. 5 was marked for identification.)

Q Now, would you discuss that Exhibit, please?

A It merely states that the plastic coated plugs, or the idea of plastic coating them, was done to increase the useful life of the tool by retarding corrosion due to the salt water or acid action, and it states that during laboratory tests plastic coated cement retainers were set in concentrated salt water and subjected to heat and pressure for periods of 72 hours without any indications of failure. This is the only information, written information or official information I have been able to obtain. However, the manager of the Baker branch in Farmington told me that since this bulletin had been put out they had experimented the same way,using acid instead of salt water for a period of 72 hours and they did.--There was no apparent sign of failure after 72 hours in acid, and using heat and pressure to test it similar to the way they used the salt water.

Q Now, in the present condition of this hole, would it be possible to replace that bridge plug?

A No, it can't be replaced or removed because we can't get to it.

(Thereupon, Caulkins' Exhibit No. 6 was marked for identification.)

Q Now, referring to what has been marked as Exhibit No. 6, will you state what that is?

A Exhibit No. 6 is just a drawing of the Otis side door choke landing nipple assembly, and the side door choke itself, showing the packing arrangement on the choke and the barrel of the choke. This particular print shows the top of it arranged for a wire line installation, and the only difference in this arrangement and what we propose is that we would have an adapter at the top of the side door choke so that it could be attached to the 1 inch tubing.

Q Now, in the event the Commission denied this application, Mr. Gray, what would your alternative be as to the treatment of the Greenhorn formation?

A Well, it could be shut-in and left there, or it could be operated as we have proposed. If in order to -- If there is any question about the permanence of the bridge plug, that is the plastic coated bridge plug which separates the Greenhorn from the Mesaverde, the only other way that it could be handled would be to plug it with some sort of mud, cement, or something like that.

Q Would that result in the loss of this production from the Greenhorn?

A Cement -- if you had it cemented, which would be probably the only permanent way to repair it, you would definitely lose the reserve of gas in the Greenhorn formation because you can't get down to get the bridge plug out, and for the same reason you couldn't get back down to it. You couldn't drill the cement out for the same reason.

Q Would it be economical to drill a well for Greenhorn production?

A The Greenhorn production of half a million feet a day would not justify drilling a well for it alone.

Q Is production normally found in the Greenhorn formation in this area?

A This is the only well that we have found sufficient justification for testing.

Q Do you know of any other Greenhorn production in the immediate area of this well?

A No, I do not.

Q Now, I believe you've already discussed Exhibit No. 7, being the production record from the Mesaverde formation, is that correct?

A Yes, sir.

Q Will this type of completion enable you to meter all the production from the three separate horizons separately?

A Yes, sir.

Q Will the fluids be handled separately?

A Yes, sir.

Q Do fluids create any problem in the production of this well under this proposed completion?

A No, I don't think they would present any problem. Actually, as far as the Mesaverde is concerned, I believe it would -- it might help it to restrict or reduce the flow space. If you will notice, on July 9 we show zero production of distillate and gas both. That was due to the well loading up with fluid, and I believe that it flowing through the annulus, it would be less likely to load up than it would be through the larger flow space, the way we have it now.

Q Now, in your opinion, will this type of completion protect the separate producing horizons from communication?

A Yes, sir, I think it will. I believe that we will -- first of all, we've had no evidence of any corrosive fluids in the well. The oil or distillate that we recovered from the Greenhorn was almost, well, it was packed by oil, there was no appreciable amount of water in it, and the plug has been in there for, oh, some six months now. And I believe if there was enough or if it was going to fail, we would have had some indication of it by this time.

Q Now, in the event, under the operation of this well, there were a packer failure at that plastic coated bridge plug,

would it become apparent?

A Yes, it would become apparent because we definitely have some gas in the Dakota formation, and if we had an increase in gas through the 1 inch tubing, well, there would be an indication that we had leakage past the bridge plug.

Q Now, referring to the upper portion of the well, the proposed triple completion, in your opinion, will that prevent communication between the separate horizons?

A Yes, sir.

Q And can you make the packer leakage test which might be required?

A We can make the packer leakage test which I have described, and they have been acceptable on the one other well.

Q In your opinion, is this proposal in the interest of conservation and the interest of waste?

A Yes, sir.

Q Were Exhibits 1 through 7 prepared by you or under your direction and supervision?

A They were prepared under my supervision and direction.

MR. KELLAHIN: At this time we would like to offer in evidence Exhibits 1 through 7.

MR. PORTER: Without objection, the Exhibits will be admitted.

(Thereupon, Caulkins' Exhibits Nos. 1 through 7 were received in evidence.)

MR. PORTER: Anyone have a question of Mr. Gray?

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Gray, what condition do you think that pipe is in below that Model D packer at 5184? Do you think your milling operations may have caused that type to have any holes in it?

A No, sir, I don't think so. We had no evidence of any pipe trouble except right at the top of the fish, at its original position, and when we were milling over it we would always hit the obstruction in the hole at the same place.

Q Do you think you have any cement sealed outside of that pipe where it has collapsed?

A The only information we have to go on is the semitone survey, and it did show that we had cement well above that point, but we still have no explanation at all to offer for the failure of the casing. It was 26 pound casing, and it is designed to set at that depth with the safety factor of 1 1/8, I believe.

Q Now, you were able to run your bit through that interval of pipe after that cement job, weren't you?

A Beg pardon.

Q After you cemented that and got the top of the cement from your survey, you were able to run your bit through there going down, weren't you?

A Yes, we cleaned the well out to TD after doing a lot of squeezing, and one thing or another on the 7 inch casing, and

we had a 6 ¼ inch bit pass that point, and not only that, but the bridge plugs themselves are only slightly smaller than the ID of the casing and if there had been any trouble when we ran those plugs in, we couldn't have run them, they would have stopped there. So the trouble -- the collapse occurred after we had set those plugs, and when we were in the process of cleaning the well out to get it back on production.

Q Are these magnesium bridge plugs designed and intended to be used as a permanent seal in a pipe?

A No, they are not designed for that purpose. It is a recent process, and it was designed to increase the useful life, but they make no claim for permanence. They do state that as long as the plastic coating is not disturbed that it may be permanent. There is no way of knowing whether you scratch that coating when you set the plug or when you are running it in or not, and they make no such claims, but they have had these tests that have shown that they would withstand contact with salt water and also acid for a period of 72 hours. And if they would last for 72 hours, they probably would be permanent.

Q Do you think there would be any way at all of dropping some hydromite through the drill collars there and getting it on top of that bridge plug?

A No, sir, I don't think so. The only thing that I do think is on top of the bridge plug is some frac sand; I'm sure there would be some frac sand on top of it.

Q Now, how long are these six seal nipples that -- or this 2 3/8 inch tubing down here at the lower packer?

A Those are 17 inches long.

Q What is the total length of them, about 9 feet, something like that?

A Yes, that's approximately right.

Q Is that sufficient length to take care of any expansion or contraction of the tubing through temperature change?

A Yes, sir. It was run for that purpose, and I think we have more than enough to take care of that and any slight error that we might have made in measuring the tubing that was run between the two packers.

Q That 2 3/8 inch tubing hasn't been perforated opposite the Mesaverde, has it?

A No. The only perforation that we have in the tubing strings is in the side-door choke itself, and the way it is now, it admits the Mesaverde production and excludes the Greenhorn.

Q You are planning to perforate that while it is in the hole?

A Yes, sir.

Q You are going to perforate it pretty close to that side-door choke, aren't you?

A Yes, we will be perforating fairly close to it. However, the reason for going to that depth was just to get to the lowest point possible in the Mesaverde to do the best job of keep-

ing the well pumped of fluid that was possible. We could come up the hole a joint or even two joints, if it were deemed necessary.

Q Wouldn't it be a lot safer, Mr. Gray, to pull that tubing and put in perforated tubing instead of perforating the one that is in the hole?

A No, I don't think so. From past experience we have never had any trouble and in this particular case we wouldn't be running any side-door chokes or anything to seal off in the tubing itself opposite the perforation; it would just be a hole that permits the production of the Mesaverde above the side-door choke.

Q Now, is this side-door choke that you are going to -- is the steel nipple that you are going to run on your 1 inch tubing, landing side-door choke, is it a locking type?

A Now, I can't answer your question. That is one thing that I wanted to satisfy myself about. If we can obtain one that can lock, that is the type that we would run.

Q You don't anticipate any difficulties flowing the Mesaverde through a one by two inch annulus there?

A No, sir. The volume of gas we are dealing with is probably less than half a million feet, and the flow space would be slightly larger, an inch and a quarter, a little less than an inch and a half.

Q Will the Pictured Cliffs be flowing through the annulus, or will it be flowing through that lead off string?

A No, that's not lead off string, that's inch and a

quarter.

Q Production would be through that string?

A Yes, through one and a quarter tubing, yes.

Q Now, you haven't been able -- with the installation you have in the hole at the present time, you haven't been able to conduct those packer leakage tests that you were talking about, have you?

A Only across the packer. I think we have very good information, we have a good job on the top packer, but we can't say positively that we have no leakage across the lower one. The only information we have that indicates it is good is from the bottom hole pressure information.

Q I see. I believe that's all. Thank you.

MR. PORTER: Anyone else have a question of Mr. Gray?

REDIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Gray, in the drilling of this well, did you find any evidence of communication as a result, either by mud or gas, as a result of your milling operations?

A No. These milling operations were carried on using gas for a circulating media. After you have fraced the Point Lookout, it's almost impossible to fill it up and to circulate water through it. So we didn't even try it, we used gas to blow the steel cutting job, and worked both ways with conventional circulation and reverse circulation, and there was never any

indication of any water other than what we would normally find in cleaning up a well after it had been fractured with as much fluid as this one.

Q Did you find any indication of corrosive fluids in this well?

A No, sir.

Q In the absence of corrosive fluids in the well, is there any reason to anticipate failure of that plastic coated packer?

A No. I believe that the fluids in contact with the packer are more or less static. It is in a pocket; there is a forty-foot pocket of sand and water between the bridge plug and the lowest perforations in the Greenhorn, so I doubt if that fluid would be disturbed, so that if -- if there was any corrosion that would destroy the bridge plug or cause it to leak, I think it would have been apparent before this time.

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

MR. NUTTER: Mr. Porter, one other question.

RECROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Gray, what kind of liquid is the Mesaverde producing?

A Distillate.

Q Is that a clear distillate?

A Yes, it is a clear distillate.

Q What about the Greenhorn, what is it producing?

A It is also a distillate. It is around 50 gravity, and it is -- it has a reddish cast. It is different from the Mesaverde.

Q I see.

A We don't have an analysis on it.

MR. NUTTER: Thank you.

MR. PORTER: Anyone else have a question of Mr. Gray? The witness may be excused.

(Witness excused)

MR. PORTER: Does anyone desire to make a comment in this case? Take the case under advisement.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, J. A. Trujillo, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me in Stenotype and reduced to typewritten transcript by me, and that the same is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my Hand and Seal this, the 30th day of July, 1959, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Josepha A. Trujillo
NOTARY PUBLIC

My Commission Expires:

October 5, 1960