BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

CASE NO. 1161 AND CASE NO. 1162

TRANSCRIPT OF HEARING

OCTOBER 17, 1956

DEARNLEY-MEIER AND ASSOCIATES
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ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
OCTOBER 17, 1956

IN THE MATTER OF:

CASE 1161: Application of Northwest Production Corporation for an order authorizing a triple gas completion in the SW/4 of Section 7, Township 26 North, Range 5 West, Rio Arriba County, New Mexico, in exception to Rule 112-A of the New Mexico Oil Conservation Commission Rules and Regulations. Applicant, in the above-styled cause seeks an order granting permission to effect a triple gas completion of its Jicarilla "W" 1-7 Well located 800 feet from the South line and 920 feet from the West line of Section 7, Township 26 North, Range 5 West, Rio Arriba County, New Mexico. The proposed producing horizons are the South Blanco-Pictured Cliffs Gas Pool and the Mesaverde and Dakota formations of two presently undesignated gas pools in the SW/4 of said Section 7. Applicant proposes to produce Pictured Cliffs gas through one small string of tubing, Dakota gas through another small string of tubing inside one larger string of tubing and Mesaverde gas through the tubing-tubing annulus.

CASE 1162: Application of Northwest Production Corporation for an order authorizing a triple gas completion in the NE/4 of Section 5, Township 26 North, Range 5 West, Rio Arriba County, New Mexico, in exception to Rule 112-A of the New Mexico Oil Conservation Commission Rules and Regulations. Applicant, in the above-styled cause, seeks an order granting permission to effect a triple gas completion of its Jicarilla "W" 2-5 Well located 990 feet from the North line and 1650 feet from the East line of Section 5, Township 26 North, Range 5 West, Rio Arriba County, New Mexico. The proposed producing horizons are the Pictured Cliffs, Mesaverde and Dakota formation of three presently undesignated gas pools in the NE/4 of said Section 5. Applicant proposes to produce Pictured Cliffs gas through one small string of tubing, Dakota gas through another small string of tubing inside one larger string of tubing and Mesaverde gas through the tubing-tubing annulus.

BEFORE:

Mr. A. L. Porter
Mr. E. S. (Johnny) Walker

TRANSCRIPT OF PROCEEDINGS

MR. PORTER: The meeting will come to order, please. Next case on the docket is Case No. 1161, and I believe the representative for Northwest Production Corporation has a request in relation to consolidating the two cases.

MR. JOHNSTON: Yes, sir. These two wells, if approved, will be completed in an identical manner, and they are located approximately one mile apart. I would like to take them up as one case.

MR. PORTER: For the reason of taking testimony in Cases 1161 and 1162, is there any objection to consolidation? If not, let the record show that the two cases will be consolidated for the purpose of --

MR. GURLEY: 1161, 1162, Application of Northwest Production Corporation for an order authorizing a triple gas completion in the SW/4 of Section 7, and the NE/4 of Section 5, Township 26 North, Range 5 West, Rio Arriba County, New Mexico, in exception to Rule 112-A of the New Mexico Oil Conservation Commission Rules and Regulations.

MR. PORTER: All right, Case No. 1162, would you read that?

MR. GURLEY: I combined the two, one was in SW of 7, and the other was in the NE of 5.

MR. PORTER: Will you swear the witness?

MR. WALKER: I would like the record to show that Mr. Johnston is being sworn in on both cases, 1161 and 1162.

(Whereupon, Mr. Johnston was sworn as a witness and testified as follows:)

MR. PORTER: You may proceed with your testimony.

MR. JOHNSTON: Northwest Production has found that --

MR. WALKER: For the sake of the record, identify yourself.

MR. JOHNSTON: I am W. R. Johnston, manager of production operations, Northwest Production Corporation. Northwest Production has determined that there is a sizeable Dakota gas reservoir extending over a major portion of the southeastern San Juan Basin, the wells that we have drilled are of quite low volume producing capacities; for that reason, it's not economically feasible to triple and produce this gas from the Dakota formation alone. Therefore, we are requesting authority to attempt two drill zone completions. I would like to introduce as Exhibits, first, --

MR. GURLEY: Excuse me just a moment, for your own purpose there, would you wish to qualify yourself as an expert witness for your engineering testimony?

MR. JOHNSTON: Yes, I would.

MR. GURLEY: Would you then give the Commission your educational background? You have not appeared before the Commission before?

MR. JOHNSTON: No, sir, I have not.

MR. GURLEY: Would you give the Commission your educational background and experience so you could qualify?

MR. JOHNSTON: I am a graduate petroleum engineer from the University of Texas, graduated in 1942, after the Service, I worked for Humble Oil and Refining Company for 7 years in various engineering capacities both in drilling and production until I resigned from Humble in 1955 and worked as manager of Production Operations for Pacific Northwest Pipeline Corporation until Northwest Production Corporation was initiated at which time I became manager of Production Operations for that Corporation. I have been active in field operations all of my professional life since graduation from college. I feel well qualified to testify on any completion work in the oil field.

MR. GURLEY: Has most of your experience been in the State of New Mexico?

MR. JOHNSTON: No, sir, it has not. I have been permanently in New Mexico only the past year and a half, four years prior to that I worked with Humble in Midland, Texas and did have supervision of operations in Lea County, but I was based in Midland.

MR. PORTER: Has your experience in New Mexico been mostly in the San Juan Basin?

MR. JOHNSTON: That's right, sir.

MR. PORTER: The witness' qualifications are acceptable to the Commission. You may proceed with your testimony.

MR. JOHNSTON: As Exhibit No. 1, location and ownership

plat for the well with 107 located in Section 7, Township 26 North, Range 5 West --

MR. PORTER: Do you have extra copies of that Exhibit?

MR. JOHNSTON: I do. Exhibit 2 is a diagramatic sketch of the manner in which we propose to perform the triple completion in the "W" 1-7 Well. Exhibit 3, location and ownership plat for the Well "W" 2-5 in Section 5 of 26 North, Range 5 West. Exhibit 4 is a diagramatic sketch of the equipment proposed to be used in the completion of the "W" 2-5 Well. Exhibit 5, manufacturer's drawing of the well head assembly which we propose to use for the triple completion. I referred to the Dakota reservoir which we feel is not economically feasible to produce by itself, I would like to point out that with our methods of gas drilling when we have reached the base of the Mesaverde formation providing the hole remains dry, which it did in these two wells, only three more days rig time is necessary to penetrate the Dakota formation. It makes explorations for the Dakota quite inexpensive if you are going to drill the Mesaverde anyway, and our thought on it is in any area where we have this low volume Dakota and have a Mesaverde well, we would drill on to the Dakota and effect a triple completion or a dual, which has been previously authorized for this. There is, in addition to this cost of drilling, there is a great aid in the pipe line companies in the cost of gathering affected by the triple completion. It is estimated that each well head gathering line head requires an investment of around $30,000.00. If we had to have three separate wells in the

place of this, we would have effected a gathering dehydration cost of approximately $90,000.00, where with three zones in one well we figure it could be handled for $45,000.00, it would be more than a single, because you would have to have separations and measuring facilities for each zone. The manner in which we propose to make the triple completion as shown on either one of the diagramatic sketches, we plan to use a Baker Model DA Production Packer in the Dakota formation; we will have two-inch tubing from there to the top of the Mesaverde formation an interval of approximately 25- or 26-hundred feet, the packer used at this point would be an anchor type packer, that is one that sets on direct weight. From there to the surface, we will use 2 and 7/8 OD tubing, we will run an Otis Side Door Choke directly below the upper packer; we will then run a string of one and a quarter inch non-upset tubing with a pack of assembly made by the Otis Company to pack off below the Side Door Choke. Lastly, we will run a string of one-quarter inch tubing in the 7 and 5/8, 2 and 7/8 tubing annulus to produce. In this manner, the Dakota will be produced up the 2-inch and will enter the inch and a quarter approximately opposite the Mesaverde perforations; the Mesaverde formation will be produced through the Side Door Choke and then into the annulus of the inch and a quarter; The Pictured Cliff formation will be produced through the inch and a quarter hanging between the 2 and 7/8 and 7 and 5/8. I did not point out, but this well and most any one like it is equipped with a liner so that we have 7 and 5/8 inch casing down through the Pictured Cliffs formation. If you

will refer to the manufacturer's drawing of the well head, we will be able to obtain pressures of all three zones, bottom pressures can be taken of the Pictured Cliff and Dakota formations with the present hookup; to take a bottom hole of the Mesaverde, it would be necessary to pull the inch and a quarter tubing, set a tubing choke, shutting off the Dakota and then the bottom hole could be taken of the Mesaverde. However, for our uses, we feel we can obtain satisfactory surface pressures and calculate bottom hole pressures. I think that is all my testimony.

MR. PORTER: Does anyone have a question of Mr. Johnston?

MR. GURLEY: Has your company had any experience in triple completions in any other area?

MR. JOHNSTON: No, sir, we have not. We have done considerable duals in the San Juan Basin, this essentially is a dual completion, other than -- it's the same mechanical means; I am familiar with cases of running two strings of tubing and producing in the annulus, that has worked satisfactorily with this same Packoff.

MR. GURLEY: Have you had any personal experience with triple completions?

MR. JOHNSTON: No.

MR. MANKIN: Mr. Johnston, do you anticipate considerable liquids being produced from either of these three formations?

MR. JOHNSTON: Not considerable liquids, I feel that the Dakota formation will produce a small amount of distillate and water; actually, the inch and quarter that will be handling the Dakota should

help us keep the well clean, we tested the Dakota in both of these wells, and they will produce one of them about 300,000 cubic feet a day, along with four or five barrels of mixed distillate and water; the inch and quarter would be a much better method of keeping the Dakota clean than would be the two-inch. It is a typical small volume deal. I do not anticipate any appreciable liquid production from either the Pictured Cliffs or the Mesaverde formation.

MR. MANKIN: It is possible, is it not, that in the Pictured Cliffs there will be water production?

MR. JOHNSTON: It is entirely.

MR. MANKIN: But you don't anticipate any distillate of any consequence from the Mesaverde?

MR. JOHNSTON: I don't know, we have not completed, or produced, we have completed several in the area, but have not produced them to any extent to determine how much distillate production we will get. It is, I suppose, normal to assume that it will be similar to the wells in the Basin, they will produce about three barrels per million.

MR. MANKIN: Was there any test made on these as they were drilled?

MR. JOHNSTON: No.

MR. MANKIN: You have no knowledge of --

MR. JOHNSTON: We have electric logs, they are near enough to known Pictured Cliffs Horizons, that we believe it will be producing, but we have not tested the well.

MR. MANKIN: You have no knowledge of whether they are large or small or average wells?

MR. JOHNSTON: The offset are in range of million to a million and a half, which is quite small. However, they are old.

MR. MANKIN: Mesaverde, do you have any knowledge of volumes there?

MR. JOHNSTON: Yes, on one well, one well is testing in the Mesaverde now, on the "W" 2-5, we plugged it off pending our hearing and fracked the Mesaverde; it's cleaning up water now. It looks like it has a potential producing capacity of something like 400,000 cubic feet a day, which is a small well.

MR. MANKIN: So none of these three zones would be large wells in your estimation?

MR. JOHNSTON: Our feeling is that by the triple completion we can possibly deliver from the well in the range of a million two hundred thousand a day, they are all in the range of something like 400,000 per zone. That is the primary reason we were asking for the triple, had we a 30 million well in one zone, we would undoubtedly take that and be very happy with it.

MR. MANKIN: I believe that is all.

MR. UTZ: Mr. Johnston, can you tell me what the formation pressures are for these three zones in this particular area?

MR. JOHNSTON: Yes, the Dakota will have about 2900 pounds bottom hole pressure, the Mesaverde formation around 1200 and the Pictured Cliff 1100.

MR. UTZ: So that between the Mesaverde and the Dakota, you will have a pressure differential of around 1600 pounds?

MR. JOHNSTON: That's right.

MR. UTZ: Actually, the packer between the Mesaverde and the Dakota is set in such a manner that there will be an accumulation of liquids on top of the packer, is that correct, --

MR. JOHNSTON: Yes.

MR. UTZ: -- which would tend to decrease that pressure differential?

MR. JOHNSTON: It will cross the packer.

MR. UTZ: And there is only possibly a hundred pounds between the Pictured Cliff and Mesaverde?

MR. JOHNSTON: That's right.

MR. UTZ: That is all I have.

MR. MANKIN: I have one question. Mr. Johnston, will the production from the Pictured Cliff be through the tubing or will it be a combination of the tubing and casing tubing annulus?

MR. JOHNSTON: Depends entirely on the volume, Mr. Mankin. I anticipate it will be through the tubing only. In the event we made a well that would deliver in excess of a million cubic feet a day, your friction loss in your inch quarter gets high, and to handle the well, we would want to produce it through the casing.

MR. UTZ: Can you tell me, Mr. Johnston, what the interval is between the Mesaverde perforations and the Dakota Mesaverde packer?

MR. JOHNSTON: Yes. The bottom perforation, 5336 in the Mesaverde, this is the "W" 1-7, the top of the Dakota at 7442, that is 2100 feet, and we would set that packer probably 50 feet above the top of the Dakota, so it would be around 2,500.

MR. UTZ: That is all.

MR. NUTTER: I am not sure if I follow the scheme for producing this completely, your Dakota comes into the 2-inch tubing?

MR. JOHNSTON: Right.

MR. NUTTER: Below the lower packer?

MR. JOHNSTON: Yes.

MR. NUTTER: Sometimes up through this side door choke and produced through in what size tubing?

MR. JOHNSTON: It is packed over at the side door choking, and enters the inside of the inch quarter.

MR. NUTTER: That is an inch quarter inside the 2 and 7/8?

MR. JOHNSTON: That's right. This is a standard sized door choke that is used everywhere in the Basin for duals, except that you delete the upper packing element, you have only the lower below the choke which allows your Mesaverde gas to come in through the choke.

MR. NUTTER: And your Pictured Cliff is going to be produced through inch and a quarter?

MR. JOHNSTON: That's right.

MR. NUTTER: And above the side door choke the Dakota will be produced in inch and a quarter?

MR. JOHNSTON: Right.

MR. NUTTER: And Mesaverde in the annulus between 2 and 7/8 tubing and inch and a quarter?

MR. JOHNSTON: That's right.

MR. NUTTER: How does the hydraulic radius of the annulur space between those tubing spaces compare with the rating between inch and a quarter?

MR. JOHNSTON: Strangely enough, inch and a quarter is the smallest producing area in the well, the area -- cross sectional area -- which is your producing capacity of the inside of the inch and a quarter area is 1.496 square inches. The area in the annulus, the 2 and 7/8 inch quarter pipe body is 2.516 square inches and the tightest area at the shoulders, 1.545 inches, so our minimum hydraulic radius of producing capacity, are the identity test of the inch and a quarter which is the standard producing.

MR. NUTTER: What is the inside diameter of the inch and a quarter?

MR. JOHNSTON: 1.380.

MR. NUTTER: And what is the outside diameter of inch and a quarter?

MR. JOHNSTON: 1.660, if I remember correctly.

MR. NUTTER: I believe that is all I have.

MR. MANKIN: One last question, you have not as yet run a packer leakage test on one of these?

MR. JOHNSTON: No, sir, we have not completed --

MR. MANKIN: Upon the favorable approval of this you would

run packer leakage test and submit an affidavit?

MR. JOHNSTON: Yes, I presume we would follow the same procedure as on the dual a week apart with the recording pressures.

MR. MANKIN: In which case the charts and schomatic diagram would be submitted along with that?

MR. JOHNSTON: That's right.

MR. PORTER: Mr. Arnold, do you have any questions?

MR. ARNOLD: No, I have no questions.

MR. PORTER: Does anyone else have a question of the witness? You wish to offer your Exhibits 1 through 5 in evidence, Mr. Johnston?

MR. JOHNSTON: Yes, I would like to offer Exhibits 1 through 5 in evidence.

MR. PORTER: Were these Exhibits prepared by you or under your supervision?

MR. JOHNSTON: Four were, one is a manufacturer's drawing which I specified.

MR. PORTER: Yes, sir. Is there any objection to the admittance of these exhibits? They will be admitted. The witness may be excused.

(Witness excused.)

MR. PORTER: Does anyone have anything further in this case, any statements to make; these cases, rather. If not, the cases will be taken under advisement.

C E R T I F I C A T E

STATE OF NEW MEXICO)
: ss
COUNTY OF BERNALILLO)

I, THURMAN J. MOODY, 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/or under my personal supervision, 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 31st day of October, 1956, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Thurman J. Moody
Notary Public.

My Commission Expires:

April 3, 1960.