

BEFORE THE  
OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico  
July 27, 1960

EXAMINER HEARING

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IN THE MATTER OF: )

Application of Continental Oil Company for )  
an order authorizing the triple completion )  
of its Northeast Haynes Apache Well No. 9-1, )  
located in the NW/4 SW/4 of Section 9, )  
Township 24 North, Range 5 West, Rio Arriba )  
County, New Mexico, in such a manner as to )  
permit the production of gas from the Mesaverde )  
formation, the production of gas from the Gallup )  
formation and the production of gas from the )  
Greenhorn formation through parallel strings of )  
2 7/8 inch, 4 1/2-inch, and 4 1/2-inch casing re- )  
spectively, cemented in a common well bore. )  
Applicant also proposes to install tubing in )  
the latter two zones. )

Case 2019

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BEFORE: Daniel S. Nutter, Examiner.

TRANSCRIPT OF HEARING

MR. PAYNE: Application of Continental Oil Company for  
an order authorizing the triple completion of its Northeast Haynes  
Apache Well No. 9-1, located in the NW/4 SW/4 of Section 9, Town-  
ship 24 North, Range 5 West, Rio Arriba County, New Mexico, in  
such a manner as to permit the production of gas from the Mesaverde  
formation, the production of gas from the Gallup formation and the  
production of gas from the Greenhorn formation through parallel  
strings of 2 7/8 inch, 4 1/2-inch, and 4 1/2-inch casing respectively,  
cemented in a common well bore. Applicant also proposes to install

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tubing in the latter two zones.

MR. GRIFFITH: I have already been introduced in this case. We have the same witness, Mr. MacLennan, and ask that he be sworn again if necessary.

MR. PAYNE: Let the record show that he was sworn in the previous case.

M. A. MacLENNAN

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

DIRECT EXAMINATION

BY MR. GRIFFITH:

Q You are the same Mr. MacLennan that just testified before the Commission as an employee of Continental Oil Company?

A Yes, I am.

MR. GRIFFITH: Would the Commission accept the qualifications of the witness?

MR. NUTTER: Yes, sir. Please proceed, Mr. Griffith.

MR. GRIFFITH: Would the reporter mark these Exhibits 1 and 2?

(Whereupon, Continental's Exhibits 1 and 2 were marked for identification.)

MR. GRIFFITH: Continental Oil Company would like to stipulate with the counsel for the Commission that if Ken Kirkland were here and ready to testify, he would testify substantially in



conformity with Exhibit 2. I would like to read Exhibit 2.

"My name is Ken Kirkland. I am an employee of Continental Oil Company as Continental's Land Superintendent of the Durango Division. I am familiar with Exhibit 1, prepared for Continental's application in Case No. 2019, scheduled for hearing on July 27, 1960. This exhibit was prepared under my supervision. The shaded area shows our leases in the Northeast Haynes Block No. 206 in Rio Arriba County, New Mexico. The proposed triple completion will be located 1850 feet from the South line and 790 feet from the West line of Section 9, Township 24 North, Range 5 West. Exhibit 1 correctly shows the ownership of acreage surrounding Continental's leases."

Will the attorney for the Commission so stipulate?

MR. PAYNE: Yes, the record will show where the well was located, in any event.

MR. GRIFFITH: I would also like to state at the outset that Continental has changed the name of this well, as it appears in the Commission's records, as Northeast Haynes Apache 9-1. We have officially changed the name to Northeast Haynes No. 9-1.

MR. NUTTER: Would you repeat that, please?

MR. GRIFFITH: Northeast Haynes No. 9-1.

MR. NUTTER: Thank you.

MR. GRIFFITH: Would the reporter mark these as Exhibits

3 and 4?

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(Whereupon, Continental's Exhibits 3 and 4 were marked for identification.)

MR. GRIFFITH: Exhibits 3 and 4 have been furnished to the Commission as a part of our original application.

Q Mr. MacLennan, would you examine Exhibit 3 and tell me if you can identify this exhibit?

A Exhibit 3 is a schematic drawing showing the proposed casing and cementing program for a triple casing completion for Northeast Haynes No. 9-1.

Q Was Exhibit 3 prepared by you or under your supervision?

A Yes.

Q Would you state briefly what Exhibit 3 shows?

A Exhibit No. 3 shows the diameter of hole size to be drilled, the size of casing, the setting depths, estimated formation tops and bases and location of stage collars for cementing.

Q You have heard the stipulation as to the location of this well. Is this your understanding where the well will be located?

A Yes, it is.

Q In what formations is this well to be completed?

A We propose to complete this well as a gas producer in the Mesaverde, a gas producer in the Gallup and a gas producer in the Dakota.

Q What is the estimated top and base of each of these formations?

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A The estimated tops and bases of the producing formations are as shown on Exhibit 3. Estimated top of Mesaverde is 3910, the estimated base at 4792; the estimated top of the Gallup is at 5655, estimated base is at 6250; estimated top of the Dakota is at 6690, and the estimated base at 6990.

Q In the previous case you described the producing formations of the Gallup and Dakota. Are these similar to the formations located in this well?

A Yes, they are.

MR. GRIFFITH: We ask that Mr. MacLennan's testimony in Case No. 2018, in reference to the formations of the Gallup and Dakota, be incorporated by reference in this application and in this hearing.

MR. NUTTER: The testimony in the previous case will be incorporated by reference.

Q Would you describe the Mesaverde formation?

A The Mesaverde formation consists of sandstones, shales and silts and coals; sands are fine-grained and well sorted, interbedded with these shales and silts. Common source of supply for the Mesaverde is based upon the environment of deposition and considered separate from that of the other producing formation. The Mesaverde is isolated from above and below by impermeable shales.

Q What is the basis of your information on these proposed producing formations and their estimated depths?



A The description of the formation, estimated tops and bases, were obtained from geologic studies of available core analysis and well logs of wells in the area.

Q Is the proposed completion of this well a little different from the completion of the well in Case No. 2018?

A There is some difference, one being the hole size on the Northeast Haynes well, we plan to drill a 16 inch hole similar to the Jicarilla Well and 12 inch hole to the base of the Gallup and then the hole size from the base of the Gallup to the Dakota will be 7 inch.

MR. GRIFFITH: We ask that Mr. MacLennan's previous testimony in Case No. 2018, as to the proposed drilling and completion of this well, be incorporated by reference into this hearing.

MR. NUTTER: It will be.

Q Is there anything you would like to add on the cementing of this well that might be different from the first well?

A No, sir, the cementing will be quite similar. All cementing will be done through the two strings of 4½-inch casing and stage collars used to cement the formations above the Dakota and Gallup.

Q How do you plan to perforate these multiple strings?

A We plan to use conventional bullet gun for perforating the Dakota and use Lane-Wells nuclear oriented directional gun for the Gallup and Mesaverde.

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Q What additional action will you take to complete the well?

A We plan to selectively sand-oil treat the Gallup and Dakota and acidize the Mesaverde.

Q What type of well head will be used?

A We will use a triple casing well head assembly, designed to prevent commingling of the production from the three formations. It will be a head similar to the one used in the Jicarilla well.

Q Would you examine Exhibit 4 and tell if this exhibit was prepared by you or under your supervision?

A Yes, it was.

Q What does this exhibit show?

A It is a schematic drawing for triple casing well head assembly, showing the three separate strings of casing, the separate tubing heads and control valves.

MR. GRIFFITH: Would the reporter mark this Exhibit 5?

(Whereupon, Continental's Exhibit No. 5 was marked for identification.)

Q By whom was Exhibit 5 prepared?

A Exhibit 5 was prepared for Continental Oil Company by the Rector Well Equipment Company, Inc.

MR. GRIFFITH: I would like to ask that the testimony of Mr. MacLennan in Case No. 2018, as to this type of well head, be incorporated in this case by reference.

MR. NUTTER: Yes, sir, it will.



Q Will the proposed completion in this well provide for separation of production in the well and at the surface?

A Yes, it will.

Q And will the completion allow for separate reservoir pressure testing?

A Yes.

Q How will you test to determine possible communication between the completed zones?

A We propose to run tests similar to that for packer leakage tests in a dual completion.

Q Will this completion allow for the determination of the gas-oil ratio from each zone?

A Yes, it will.

Q Would you state briefly why Continental Oil Company wants to triply complete this well in this manner?

A Continental Oil Company desires to use this type of completion primarily for economic reasons. The proposed type of completion will result in considerable savings over a dual completion. Also, it is possible to complete in the Mesaverde this well, which we feel does not have sufficient reserves to support an individual well or part of a conventional dual completion. Also, it is anticipated that costs for the majority of workovers will be considerably less than those encountered in a dual completion.

Q And it won't be necessary, will it, to shut in the



production from all three zones in order to work over one zone?

A No, the majority of workovers can be conducted on one zone without interrupting the production from the other two.

Q Will the correlative rights of the land owners be protected?

A Yes, sir.

MR. GRIFFITH: Does the Commission have any questions of this witness?

MR. PAYNE: Yes, sir.

MR. NUTTER: Mr. Payne.

CROSS EXAMINATION

BY MR. PAYNE:

Q Mr. MacLennan, you do intend to produce the lower two zones through a tubing?

A Yes, sir.

Q Do you also intend to bring the cement to two or three hundred feet above each producing zone?

A Yes, sir.

Q You also intend to use casing centralizers through each pay zone?

A Yes, we do.

MR. PAYNE: Thank you.

BY MR. NUTTER:

Q Mr. MacLennan, going back to Case No. 2018, do you plan



to use a seating nipple in the string of 2-3/8 inch casing that you'll run to the Greenhorn?

A A seating nipple?

Q Yes, sir.

A No, sir, at the present time, for pumping well?

Q Yes, sir.

A We're looking at a bottom hole pump similar to a casing type pump for anchoring it. It does not use a seating nipple.

Q You will be able to artificially lift the Greenhorn if it becomes necessary?

A Yes, sir.

Q Of course, the tubing in either of the two zones will be pulled and altered if necessary to provide for artificial lift?

A Yes, sir.

Q Now, in the event you should encounter oil in this case here in 2019, will you be able to artificially lift those zones?

A Yes, sir. From our geologic studies and available information we have from that area, possibly the only zone that will be oil productive will be the third zone of the Gallup, and in that case we would produce it through the tubing with a conventional bottom hole pump.

Q It's unlikely that oil would be encountered in the Mesaverde, but if it should be, would you be able to produce that oil through the 2-7/8?



A Yes, through the 2-7/8, similar to the method used in the Greenhorn.

Q What is the estimated cement top above the Pictured Cliffs in this well?

A Above the Pictured Cliffs it will be two to three hundred feet above the top.

Q What about the cement on the Mesaverde?

A In the Mesaverde it will be two to three hundred feet above our uppermost perforation. Possibly there's, it's a large size interval there and it will not be productive near the top.

Q What is the interval that you expect to be perforating the Mesaverde? The top is at 3910, is that correct?

A 3910, yes, sir. In looking at logs, it appears that the top well, it varies, but the top is sort of erratic. The sand does not look as commercial. There's streaks all throughout the Mesaverde and it will be determined from logs and core on our perforation.

Q You don't know yet just what your perforated interval will be?

A No, sir, we do not.

Q But you'll cement it to two or three hundred feet above the highest perforation?

A Yes, sir.

Q What about the cement on the Gallup formation?



A It will be two to three hundred feet above the top of the Gallup.

Q Then the third zone is the Dakota, correct?

A Yes.

Q Where will the cement be on the Dakota formation?

A We'll bring the cement continuously from the base above the Greenhorn two to three hundred feet above the top of the Greenhorn formation.

Q Mr. MacLennan, when you run your temperature survey to find your cement top and the cement hasn't come as high as you calculated, is there any remedial action that you can take?

A Yes, sir. We can work in this 4- $\frac{1}{2}$  inch pipe and squeeze.

Q You can perforate the pipe?

A Yes, perforate and squeeze it.

Q And squeeze it. This would also be the method for correcting any communication that you might discover later on between the two zones?

A Yes, sir. Also, I might point out we plan to run a cementing shoe on our string of 2- $\frac{7}{8}$  inch tubing. We would like to keep any cement out of there at all, but if necessary, we can use that for cementing if we have trouble encountered or cement tops lower in the area of the Gallup or Mesaverde.

Q What will be the zone on the long string that is centralized?



A It will be through the Dakota formation.

Q Then you'll have turbulizers on the other string of 4- $\frac{1}{2}$  inch?

A No, sir, on the string of 2- $\frac{7}{8}$ 's.

Q You'll have centralizers on the 4- $\frac{1}{2}$  to the Gallup?

A Yes.

Q What will be the zone of centralizers there?

A Through the Gallup producing interval.

Q Then how many, or what interval will be turbulized on the 2- $\frac{7}{8}$  inch?

A Through the Mesaverde formation.

Q Do you have any knowledge of the bottom hole pressures that you'll encounter in these three zones?

A No, sir, I do not. I believe they will be quite similar to those encountered in the Jicarilla area.

MR. NUTTER: Any further questions of Mr. MacLennan? He may be excused.

(Witness excused.)

MR. GRIFFITH: I move that Continental's Exhibits 1, 2, 3, 4 and 5 be admitted into evidence.

MR. NUTTER: Continental's Exhibits 1 through 5 will be admitted.

MR. GRIFFITH: I would like to state at this time that Continental's application in this case was corrected to correctly



reflect the proposed producing formations, and a corrected copy of the application was mailed to all of the offset operators in the area. Also, in connection with these two cases, Case No. 2019 and Case 2018, there is present and ready to testify, if the Commission desires, a Mr. Mel Davis, who is a representative of the Rector Manufacturing Company, whose type of well head equipment we are going to use. If the Commission has any further questions concerning this type of equipment, he is prepared to be sworn and testify at this time to answer any question.

MR. NUTTER: Mr. Griffith, the well head equipment to be used, is that depicted on Exhibit 5 in each case?

MR. GRIFFITH: Yes, sir.

MR. NUTTER: I think the equipment is pretty well explained by the exhibit and no further testimony will be necessary on that point. We appreciate having that man available, however.

MR. GRIFFITH: That's all we have in this case.

MR. NUTTER: Does anyone have anything further for Case 2019? We will take the case under advisement, and take a fifteen-minute recess.

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STATE OF NEW MEXICO )  
  : SS  
COUNTY OF BERNALILLO )

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 31st day of July, 1960.

*Ada Dearnley*  
\_\_\_\_\_  
Notary Public-Court Reporter

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. 2019, heard by me on 7/27, 1960.

*[Signature]*  
\_\_\_\_\_  
Examiner  
New Mexico Oil Conservation Commission

