

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico

April 25, 1962

EXAMINER HEARING

IN THE MATTER OF:

Application of Amerada Petroleum Corporation for a)
quadruple completion, Lea County, New Mexico.)
Applicant, in the above-styled cause, seeks)
permission to complete its State NJ "A" Well No. 3)
located in Unit A of Section 2, Township 25 South,)
Range 37 East, Lea County, New Mexico, as a quadruple)
completion (combination) in the San Andres, Blinebry) CASE
Drinkard and Devonian formations in the North Justis) 2534
Field with the production of oil from the Devonian)
and Drinkard formations to be through separate strings
of 1 1/2-inch tubing set within parallel strings of 3)
1/2-inch casing, and the production of oil from the)
Blinebry formation through a parallel string of)
2 7/8-inch casing; applicant proposes to dispose of)
salt water into the San Andres formation through a)
parallel string of 2 3/8-inch casing.)

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

MR. UTZ: Case 2534.

MR. MORRIS: Application of Amerada Petroleum Corpora-
tion for a quadruple completion, Lea County, New Mexico.

MR. BUSHNELL: H. D. Bushnell in association with
Kellahin and Fox appearing for Amerada. We have one witness.

(Witness sworn.)

MR. UTZ: Are there other appearances in this case?

You may proceed.

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MR. BUSHNELL: The purpose of this application is to comply with state-wide Rule 112 which requires Hearing for purposes of multiple completion where none has been granted of this type in any of the fields affected and also to obtain permission to use tubing smaller than 1.670 I.D.

J. R. ENLOE, JR.,

called as a witness herein, having been first duly sworn on oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BUSHNELL:

Q Would you state your name and company for which you are employed?

A My name is J. R. Enloe, Jr. I am employed by Amerada Petroleum Corporation as Division Engineer located in Midland, Texas.

Q Have you testified previously before this Commission which has accepted your qualifications as an expert witness?

A I have not.

Q Would you state, in summary, your qualifications, including education and work or employment?

A I received a B.S. Degree from Texas Technological College in May of 1949. That Degree was in Petroleum Engineering, I joined Amerada in January of 1950. Since that time I have been closely connected with the drilling and production operations in the States of New Mexico, Oklahoma, North Dakota and Texas. I am



a registered professional engineer in the State of North Dakota. I have been directly connected with operations in New Mexico and particularly in southeastern Lea County for a period of four to five years.

MR. BUSHNELL: Are his qualifications accepted?

MR. UTZ: Yes, sir.

(Whereupon, Applicant's Exhibit
No. 1 Marked for Identification)

Q (By Mr. Bushnell) I hand you what has been identified as Amerada's Exhibit No. 1. Would you state what that is and what it shows?

A Exhibit No. 1 is a plat showing portions of Township 24, 25 and 26 South, Range 37 East. This area is known as the North Justis Area. It is located in southeastern Lea County. The exhibit also shows ownership of leases in the area. It indicates completed wells and locations, it also indicates zones of completion of wells, according to the information that we had available at the time this plat was prepared. The exhibit also shows the location of the Amerada State NJ "A" Well No. 3, subject well being the subject of this Hearing, this well is located in Unit A, Section 2, Township 25 South, Range 37 East. This well is within the red circle shown on this exhibit.

Q When was the NJ "A" No. 3 well spudded?

A This well was spudded January 21, 1962.

(Whereupon, Applicant's Exhibit
No. 2 Marked for Identification)



Q I hand you what has been marked as Amerada's Exhibit No. 2 and ask you to identify and explain what that shows?

A Exhibit No. 2 is a gamma ray acoustic velocity log taken in the Amerado State NJ "A" Well No. 3. On this log, this exhibit, is shown the tops of the formation of interest in this particular well subject to this particular Hearing. It also indicates the perforated intervals and the proposed zones of completion for this quadruple completion. At a depth of 3,606 feet on the log is shown the top of the San Andres, the San Andres zone is proposed to be used for salt water disposal of produced salt water from the NJ "A" lease.

The San Andres zone is perforated over the interval from 4,280 feet to 4,375 feet. The top of the Blinbry zone occurs at a depth of 4,996 feet. The Blinbry interval is selectively perforated over a gross interval from 5,286 feet to 5,475 feet. The top of the Drinkard was encountered in this well at 5,867 feet and is so shown on Exhibit No. 2. This zone has been selectively perforated over the gross interval 5,946 to 6,132 feet. The top of the Devonian zone as indicated by this log is at 6,727 feet, the Devonian zone has been selectively perforated over the gross interval from 6,820 feet to 6,880 feet.

(Whereupon, Applicant's Exhibit No. 3 Marked for Identification)

Q Now, with reference to the manner of completion of this well, I hand you what is identified as Amerada's Exhibit

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No. 2 which is a Schematic and ask you what that shows?

A I believe this is Exhibit No. 3.

Q I'm sorry, yes.

A Exhibit No. 3 is a Schematic Diagram showing the method of multiple completion employed in completing the State NJ "A" Well No. 3. This completion is what is commonly called a small diameter multiple completion. It can further be defined as a combination type completion. We might review the details of this particular completion; 16 inch casing was set at 258 feet, cemented with 450 sacks and the cement circulated back to the surface. 10-3/4 inch casing was set at 2,345 feet and cemented with 1,300 sacks. The cement circulated back to the surface. The well was drilled to a total depth of 7,245 feet.

Four strings of casing were then run in this well as follows: For convenience' sake we have numbered the strings as No. 1, 2, 3 and 4. The No. 1 string is 3½ inch O.D. set at 7,240 feet, the No. 2 string is 3½ inch O.D. set at 2,740 feet. The No. 3 string is 2-7/8 inch O.D. set at 7,235 feet, the No. 4 string is 2-3/8 inch O.D. set at 7,213 feet. These strings of casing were cemented in the hole with a total of 1,550 sacks of cement. The top of this cement outside these four strings of casing was found to be at a depth of 1,575 feet. This was determined by temperature survey. You will note that this top of the cement is well up inside the 10-3/4 intermediate casing and it's well above all potential zones of completion in this well.



Q The perforation intervals indicated on this Exhibit 3 are the same as those shown on Exhibit 2 on your log, is that correct?

A That is correct. We might review these briefly. The Devonian zone is perforated in what we have designated as the No. 1 string, $3\frac{1}{2}$ inch, the Drinkard was perforated in the No. 2, the $3\frac{1}{2}$ string. The Blinebry was perforated in the 2-7/8 and the San Andres has been perforated in the 2-3/8 string.

Q In that connection, attached to Amerada's application is a printed form of application for dual completion, two copies?

A Yes.

Q One covering the San Andres and the Blinebry; the other covering the Drinkard and the Devonian. Do you wish to indicate some changes reflected on that application in connection with this testimony here?

A Yes, sir. In the San Andres zone on the application for completion, we indicated an interval 3,750 to 4,550 feet. We would like to amend that to show the present perforated interval which is from 4,280 feet to 4,375 feet.

Q That's in conformity with the testimony that you have previously given?

A Yes, sir.

Q All right.

A In the Drinkard zone, additional perforations have been made since this application was submitted. We would like to change



this application to show the entire perforated interval to be from 5,946 feet to 6,142 feet.

Q Is this proposed method of multiple completion one practiced in the industry as representing good standards of the industry?

A Yes, sir.

Q Is it your opinion that this proposed method of multiple completion would maintain separation throughout the zones?

A We have proved that we can maintain separation of these zones through some production testing and some bottom hole pressure information.

Q You are satisfied, then, that it will do so, it will maintain separation?

A Yes, sir.

Q Do you have some completion data as to these respective zones, if so, would you give it to the Commission?

A The Blinebry zone is the only zone that at this time is officially completed. The potential test has been filed with the Oil Conservation Commission. On that test the well flowed 61 barrels of oil, with one barrel of water, 24 hours through a 14-64 choke, the gas-oil ratio was 17,000 cubic feet per barrel, the gravity of the produced oil was 42 degrees API.

Q What about the Devonian?

A The Devonian, of course, can not be officially completed until after this Hearing; however, a recent production test showed

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that this well flowed 64 barrels of oil, 1 barrel of water in 24 hours, through a half inch choke, the gas-oil ratio was 13,300 cubic feet per barrel, the gravity of the crude produced was 37.8 degrees API.

Q What about the Drinkard?

A The Drinkard zone currently is flowing backload oil after acid and fracture treatment stimulations. Apparently we encountered extremely poor reservoir conditions in the Drinkard zone at this location. We do not know at the present time whether this will or will not be a commercial completion.

Q Have you tested the San Andres to determine what that would take?

A The San Andres has been tested for salt water disposal; the well accepted 5 barrels per minute or 7,200 barrels per day at 2,200 pounds surface pressure. Currently the well will take about 12 barrels per hour or 288 barrels per day by gravity. This is not necessarily the capacity of this well under gravity conditions.

Q Have you run some bottom hole pressure tests?

A Bottom hole pressures were taken in all three of the proposed producing intervals. The Devonian pressure was 2,493 PSI, at a 3,680 feet sub-sea datum. The Drinkard zone showed a 2,562 PSI bottom hole pressure, at 2,830 feet sub-sea, the Blinbry zone pressure in this zone was 1,878 PSI, at 2,330 feet sub-sea. These pressures were measured at or near the mid point

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of the perforated interval in accordance with the specifications set forth by the Commission. Now, if we take these pressures and correct them all to a common datum which figure I have corrected to the Devonian datum at 3,680 feet sub-sea, the pressures are as follows: The Devonian, of course, is 2,493 pounds per square inch at that datum, the Drinkard pressure is 2,943 pounds, the Blinbry pressure is 2,970 pounds. These substantial differences in pressures at this common depth and the difference in characteristics of the produced fluids and gas-oil ratios of these different zones conclusively show that we have separation, between the producing intervals. The fact that we have pumped into the San Andres zone with 2,200 pound surface pressure with no effect on the other intervals shows conclusively that that zone is separated from the producing zone.

Q By this application you are also asking for approval to use tubing smaller than 1.670 inch ID. Referring to Amerada's Exhibit No. 3, would you state where that tubing is located?

A 1½ inch tubing strings have been run in the Devonian zone and the Drinkard zone, that is inside the 3½ inch casing strings.

Q Why have you used this size tubing?

A In the future, when it becomes necessary to artificially lift these wells, we plan to lift them by gas lift. For this particular type reservoir or these particular type reservoirs and for application of gas lift, this size tubing is the best size that



could be run for this particular size casing.

Q Does this size tubing also help you run your bottom hole pressure instruments?

A This tubing is of sufficient size that we can gather reservoir information by running bottom hole instruments through it.

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

A They were.

MR. BUSHNELL: I offer Exhibits 1 through 3.

MR. UTZ: Without objection, Exhibits 1 through 3 will be entered into this case.

(Whereupon, Applicant's Exhibits No. 1 through 3 Introduced into Evidence.)

MR. BUSHNELL: That's all.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Enloe, what is the O.D. of the inch and a half tubing?

A That is the O.D. of the inch and a half tubing.

Q 1.500?

A Yes, sir.

Q Did you use any turbulizers or centralizers on these four strings of tubing to attempt to insure a good cement job?

A Yes, sir. Turbulizers were used on each of these

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four strings of tubing or four strings of casing. They were run pretty much according to standard practices in the industry. I believe we ran one about every third joint throughout all prospective producing or completion intervals. We ran those turbulizers up to a hundred feet above to a hundred feet below those prospective intervals of completion.

Q What type of formation is there between the base of the San Andres and the top of the Blinebry?

A It is a dense limestone; not being a Geologist, that's about all I can say about it.

Q Do you feel that on the basis of your experience in this area that there will not be any possibility of vertical communication between these two zones?

A No, sir. I don't think there is any possibility. We're looking at something in the neighborhood of 900 feet or so of vertical separation on the bottom of the injection interval in the San Andres to the top of the producing interval in the Blinebry zone.

MR. UTZ: Are there other questions of the witness?

MR. PORTER: I have a couple.

MR. UTZ: Mr. Porter.

BY MR. PORTER:

Q Mr. Enloe, I would judge from the test that you have had from the Devonian and the Blinebry that you considered these probable marginal wells from the outset?



A I wouldn't consider them marginal wells, no, sir.

They're certainly gas-oil ratio oil wells, but I believe most of them have producing capacity in excess of what we've indicated here by our tests.

Q You testified, I believe, that the gas-oil ratio in the Blinebry zone was some 30 odd thousand to 1?

A I believe 17,000.

Q The Devonian, was that 13,000?

A Yes, sir.

Q Is that high for the Devonian in that area?

A Yes, sir, it is high for the Devonian in this area.

Q Where is the well located with reference to the other Devonian wells in the pool?

A Our well is considerably higher, structurally, than other wells in the Devonian that I'm familiar with.

MR. PORTER: Thank you.

MR. UTZ: Did you give the GOR for the Drinkard zone?

A No, sir. The Drinkard zone has not been tested because we are still recovering load oil.

MR. UTZ: Are there any other questions? Mr. Irby.

BY MR. IRBY:

Q Mr. Enloe, I am Frank Irby from the State Engineer's Office. Could you furnish me with a copy of the application for my records and a copy of your Exhibit No. 3?

A We certainly can.



MR. IRBY: Thank you. That's all.

MR. UTZ: I think we can furnish that right now.

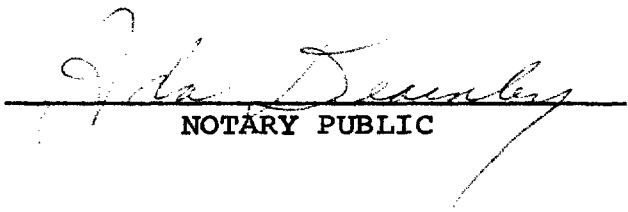
Are there other questions of the witness? The witness may be excused.

(Witness excused)

MR. UTZ: Any statements in this case? The case will be taken under advisement. We will take a ten minute recess.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

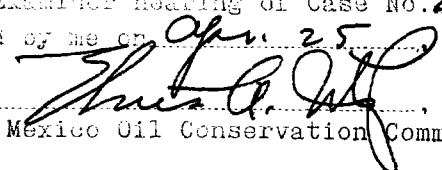
I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, New Mexico, do hereby certify that the foregoing and attached transcript of Hearing was reported by me in Stenotype and that the same was reduced to typewritten transcript under my personal supervision and contains a true and correct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


NOTARY PUBLIC

My Commission Expires;

June 19th, 1963.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2534, heard by me on April 25, 1962.


Examiner
New Mexico Oil Conservation Commission

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