BEFORE THE
OIL CONSERVATION COMMISSION
AUGUST 10, 1960

EXAMINER HEARING

IN THE MATTER OF:

CASE 2045 Application of The Ohio Oil Company for an oil-oil dual completion. Applicant, in the above-styled cause, seeks an order authorizing the dual completion of its Lea Unit Federal Well No. 1, located in unit L, Section 12, Township 20 South, Range 34 East, Lea County, New Mexico, in such a manner as to permit the production of oil from an undesignated Bone Springs Pool and the production of oil from an undesignated Devonian Pool through parallel strings of 2 3/8-inch tubing.

BEFORE:

Elvis A. Utz, Examiner

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

MR. UTZ: Case 2045.

MR. PAYNE: Case 2045. Application of The Ohio Oil Company for an oil-oil dual completion.

MR. SETH: Mr. Terrell Couch of Houston will appear for the applicant.

MR. UTZ: Thank you, Mr. Seth.

MR. COUCH: Terrell Couch for The Ohio Oil Company. I would like to state, Mr. Utz, that this well which is the subject of this hearing is the test well in the Lea Unit area. That unit

area was approved in Case 1823 by Order R-1540 entered by this Commission on November 30, 1959.

MR. UTZ: What was the number again?

MR. COUCH: The Case Number is 1823 and the Order Number is R-1540. Part of the record in that case is, of course, a conformed copy of the unit agreement that will demonstrate and verify that the unit is approximately 2560 acres in size, and includes all Federal acreage, all but one tract, which is a State lease. It will also identify all of the working interest owners and verify that The Ohio is operator of the unit.

I would like to state for the record that in addition to the acreage shown in that unit agreement as being Ohio acreage, The Ohio has earned some acreage in the drilling of this test well, and at the present time is the owner of in excess of forty percent interest in the unit. Although those exact percentages are not shown by the original unit agreement since they did not become fully effective until the well was drilled, that is the case at the present time. Also, of course, all the other working interest owners are aware of this application, and are in accord with our proposal here.

Attached to the unit agreement that is filed in the other case are Exhibits A and B. Exhibit A is a plat of the unit area which shows in greater detail the lease ownership, including lease numbers and specific identifications that will further clarify the area that's involved here.

We will have two witnesses in this case, Mr. Utz; Mr. Tom Webb and Mr. Bill Howard.

MR. PAYNE: Will you have your witnesses stand and be sworn, please?

(Witnesses sworn)

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

MR. COUCH: The first witness will be Mr. Webb.

T. O. WEBB,

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

(Whereupon, Applicant's Exhibit 1 marked for identification.)

DIRECT EXAMINATION

BY MR. COUCH:

Q Mr. Webb, will you please look at the plat that you have before you, it's marked Exhibit No. 1, and describe very briefly what it is?

A Exhibit No. 1 is a plat of the Lea Unit area. The Unit is outlined in red, and all offset operators to the Unit are indicated thereon, to the best of my knowledge.

MR. COUCH: Let me insert here, Mr. Utz, that Exhibit No. 1 shows the northeast quarter of Section 14, Township 20 South, Range 34 East, as included in the Unit and that is correct. The northeast quarter of that quarter section is as shown by Exhibit 1,

a part of the same base lease covering the north half of Section 13 immediately adjoining, as is verified by Exhibit A to the unit agreement that's filed in the previous case. The remainder of that quarter section, remaining one hundred twenty acres, was under a separate lease and was, in fact, sold, well, at the time the unit agreement was approved, it was unleased land, Federal land, it was put up for bids and was purchased by The Ohio on behalf of those working interest owners who desired to participate in it. So that it is presently within the unit and is covered by a lease owned by the same parties although all did not join in that purchase. It was purchased entirely by people already parties to the unit agreement, and will be committed to the unit within the relatively near future.

Q (By Mr. Couch) Now, with regard to the other information on the plat, Mr. Webb, is the location of this subject well shown on there?

A Yes, sir. The Lea Unit Well No. 1 is also shown on the plat. This well is located 1980 feet from the South line and 660 feet from the West line of Section 12, Township 20 South, Range 34 East, Lea County, New Mexico, or 3,120 feet from the nearest Unit boundary.

Q That is 3,000 from the west boundary of the Unit and 3,020 feet from the north boundary of the Unit?

A That is correct.

Q Those are the closest Unit boundary lines to the Unit

involved?

A Yes.

Q Tell us about the Unit, briefly.

A Briefly, the subject well was spudded on December 27, 1959, and was drilled to a total depth of 14,735 feet. The well was completed in the Devonian Section on July 8, 1960.

Q What about the casing program in the well, in general terms?

A The casing program utilized in the drilling and completion of this well conformed to the provisions of Rules 106 and 107 of the general Rules and Regulations of the New Mexico Oil Conservation Commission and adequately protects all oil, gas and fresh water bearing strata which were encountered in the drilling of the well. The oil string is 7-inch OD, 29 pound casing with a 4 1/2-inch OD, 14.98 pound hydril liner set from 13,358 feet to 14,731 feet.

Q Actually, this 4 1/2-inch liner is an extension of the production string and forms a part of it, so to speak?

A That is correct.

Q Now, the details on the intermediate string and surface pipe are shown on the diagrammatic sketch filed with this application, are they not?

A That is correct.

(Whereupon, Applicant's Exhibit 2 marked for identification.)

Q Now, Mr. Webb, you have before you, I believe, an electric induction log, marked Exhibit No. 2. Mr. Webb, will you look at what's marked Exhibit 2 and describe that briefly for us?

A Exhibit No. 2 is an electric log of the Lea Unit Well No. 1 with the tops and bottoms of the proposed producing zones and the respective intervals of perforations indicated thereon.

Q Mr. Webb, was this log all run at the same time in this well, or was it run part at different times, and is this a composite log?

A That is correct. It was run at different times, and this is a composite log of the entire logging program.

Q It was run at different times and is a composite log of the entire logging program. Have you made some indication on this composite log, which is identified as Exhibit 2, indicating various pertinent information on it?

A Yes, sir.

Q Will you state briefly what that is?

A It may be noted that the Devonian Section was perforated at 14,347 to 14,375, and 14,393 to 14,489.

Q That's shown, actually marked on the Exhibit 2, is it not?

A That is correct.

Q The perforated intervals are shown on there. How are they indicated, in color?

A No, black India ink.

Q They are indicated in black India ink. Will you tell us briefly about the Devonian completion?

A Yes. After treatment with 500 gallons of mud acid and 4,000 gallons of retarded acid, the Devonian Section potentialed for 355 barrels of oil and 6.7 of acid water in sixteen and a half hours, flowing through an 8-64-inch choke with a GOR of 321 to 1. The gravity of the crude was 55.7 degrees API.

Q Now, this well has been completed since July 8. Prior to the time it was completed, had it been assigned an allowable?

A Yes, sir.

Q State what that is.

A The Devonian Section was assigned a top allowable of 310 barrels of oil per day effective July 8, 1960.

Q Have you made any subsequent production tests, and will you state, briefly, the production history of the well to date?

A Yes, sir. We have made subsequent production tests, and these tests indicate that the well currently produced no water. The total cumulative oil production from the Devonian Section to August 1st, 1960 was 7,052 barrels.

Q What about bottom hole pressures?

A The initial static bottom hole pressure of the Devon-

ian zone was 6,046 PSIG. This pressure was measured at a depth of 14,418 feet, or the mid-point of the producing interval.

Q That was an actual measured pressure, measured at that depth, is that right?

A That is correct.

Q All right.

A Incidentally, this data has been filed with the New Mexico Oil Conservation Commission in accordance with the provisions of Rule 302 of the general Rules and Regulations.

Q Now, will you give us your opinion, based on what you now know, as to the reservoir mechanism of the Devonian zone?

A It's my opinion, based on the available data, that the reservoir mechanism for the Devonian zone is a water drive.

Q What is your idea about the possibility of artificial lift from this Devonian zone, what about the necessity for it?

A For a well in a reservoir of this type, it will not be necessary to install artificial lift facilities until such time that water encroachment into the well bore is such that the well fails to flow at the available bottom hole pressure. It is my opinion that it's reasonable to anticipate that the well will have a long flowing life in the Devonian Section.

Q And it will not be necessary to artificially lift this well for a considerable period of time, according to what you now know?

A I believe it's reasonable to expect that.

Q It's possible that that would be several years?

A That is correct.

Q Is this Devonian zone presently in a designated or undesignated status, as far as a pool?

A It is presently listed undesignated by the Commission. However, we have filed a 3-C-123 requesting that a new pool be created for the Devonian with the name Lea Unit Devonian suggested thereon.

Q We are seeking here to obtain authority to dually complete the well. In what other interval is it contemplated that we will dually complete the well?

A As may be noted from Exhibit No. 2, we propose to perforate the Bone Springs within the interval, 9480 to 9646.

Q How is that shown or marked on Exhibit 2, Mr. Webb? Is that shown?

A It's also shown in black India ink.

Q It's also shown in black India ink. What information do you have about this Bone Springs Section which you contemplate perforating?

A This Section was drill stem tested during the drilling of the subject well with the following results: The interval 9480 to 9560, was tested, and this Section flowed 22.88 barrels of oil and no water in one hour through a 5/8ths inch choke at a daily rate of 549.12 barrels of oil per day, with a gas-oil ratio of 2,030 cubic feet per barrel. The gravity of the crude obtained on

that drill stem test was 42.9 degrees API. The initial shut-in bottom hole pressure was 3,980 PSIG.

Q Was a further interval in the Bone Springs also drill stem tested?

A Yes, sir. We drill stem tested the interval 9560 to 9600. This interval flowed 28.36 barrels of oil and no water in one hour and forty-five minutes through a 5/8ths inch choke at a daily rate of 391 barrels of oil per day with a GOR of 2,006 cubic feet per barrel. The gravity of the crude produced during this drill stem test was 41.3 degrees API, and the initial shut-in bottom hole pressure for this zone was 4,060 PSIG.

Q That is as recorded on that particular drill stem test?

A That is correct.

Q Have you computed what the allowable for this Bone Springs production would be if we dually complete here under the present rules?

A Yes, sir. Utilizing an allowable factor of 3.77 for a well of this depth, the current top 40-acre allowable for the Bone Springs zone would be 124 barrels of oil per day.

Q That's based on a normal unit allowable of how many barrels a day?

A 33 barrels of oil per day.

Q Which is the current normal unit allowable?

A That is correct.

Q Now, based on those drill stem tests, what is your

opinion about whether the Bone Springs will be initially capable of producing at top allowable?

A It's my opinion that the Bone Springs Section will flow top allowable.

Q That it will flow top allowable?

A Yes, sir.

Q It will not be necessary to artifically lift at the outset?

A That is correct.

Q Give us your opinion as to what the reservoir mechanism for the Bone Springs will be or is based, on the data you now have.

A My opinion, based on the information we presently have available, is that the reservoir mechanism for the Bone Springs zone will be a solution gas drive.

Q What is your opinion with regard to the possible necessity of artificial lift facilities in the Bone Springs?

A In that this is a solution gas drive, it is my opinion that it's quite possible that the primary depletion of the Bone Springs zone can be accomplished by flowing, and that the installation of artificial lift facilities may never become necessary.

Q In any event, it would be quite a while before such artificial lift should become necessary, in your opinion?

A In my opinion, if artificial lift does become necessary, this section will have, at that time, been substantially de-

pleted, in any event.

Q Now, turn to the well itself for a moment. How long did it take to drill this well and what was the approximate cost of it?

A The time required to drill the well and complete in the Devonian Section was one hundred ninety-five days. The total cost of drilling this well, including Devonian completion costs, was approximately six hundred two thousand dollars.

Q Mr. Webb, this figure is necessarily approximate, is it not, because some of the bills have not yet come in to our company?

A That is correct.

Q This figure does not include surface equipment, such as tankage?

A That is correct. The tank battery costs are not included in this price.

Q Do you have an estimate or opinion as to the cost for drilling future Devonian wells in this area after this test well?

A Yes, sir. I estimate that it would cost five hundred forty thousand dollars to drill future Devonian wells in this area.

Q Have you made a calculation regarding the cost of dually completing this well into the Bone Springs Section?

A Yes, sir. I have calculated these costs, and estimate that it will cost twenty-four thousand six hundred dollars to dually complete this well in the Bone Springs Section.

Q Do you have any estimate or opinion as to the cost of drilling a new well to the Bone Springs Section just by itself, just drilling to the Bone Springs and completing the Bone Springs?

A Yes, sir. The cost for drilling a new Bone Springs well and completing therein is estimated to be two hundred twenty thousand dollars.

Q That figure also does not include tank batteries?

A That is correct.

Q Now, based on those calculations, how does this affect the operators from the standpoint of whether to dual or drill separate wells?

A Based on these calculations by dualling the well in the Devonian and Bone Springs zones, the working interest owners in the Lea Unit would realize a savings of one hundred ninety-five thousand four hundred dollars.

Q For each time they are dually completed as distinguished from drilling separate wells to the two formations?

A That is correct.

Q Or that, at least, would be the saving on this, yes, that would be the average saving. The actual saving here would be even greater, wouldn't it?

A Yes. That is correct.

(Whereupon, Applicant's Exhibit 3 marked for identification.)

Q Mr. Webb, I ask you, please, to look at what you have

before you, marked as Exhibit 3, and ask you if that's identical with the Exhibit that was attached to our application, except this has been marked as an Exhibit in this case?

A Yes, sir. This is the same diagram which was attached to our application.

Q I think there is a little India ink work, indicating certain refinements on it that were perhaps not on the original or one attached to the application?

A Yes, perforations for the Bone Springs tubing string and slotted perforations and circulating valve for the Devonian string.

Q This is a diagrammatic sketch of the proposed dual completion?

A That is correct. It illustrates the downhole equipment that we plan to employ in the dual completion of the well.

Q State your opinion whether the dual completion can be efficiently and effectively accomplished in the manner illustrated by the diagrammatic sketch.

A Yes, I feel that the dual completion can be efficiently and effectively accomplished.

Q Will this equipment and the detail of it be covered more specifically by the next witness?

A Yes, sir, it will.

Q In your opinion, will the approval of this application be in the interest of conservation and tend to protect correlative

rights?

A Yes, sir.

Q Certainly, no correlative rights will be damaged by granting it?

A No, sir.

Q Will this proposed dual completion cause waste?

A No, sir.

Q What about the drilling of unnecessary wells?

A Approval of this application will prevent the drilling of unnecessary wells.

Q Is it your opinion that there will be just as much oil ultimately recovered from the two zones involved here from a dually completed well as would be the case if we had a separate well to the Bone Springs and the present well to the Devonian?

A Yes, sir. The ultimate recovery to be expected from a dual completion of this type would be just as large as that that could be realized from separate wells completed in the two zones in question.

Q The net effect of this is that it can prevent the drilling of unnecessary wells and save a considerable amount of money which will be available for development of this area?

A That is correct.

Q Were Exhibits 1, 2 and 3 prepared under your supervision and direction?

A Yes.

MR. COUCH: At this time we will offer Exhibits 1 through 3 in evidence, and that will conclude our direct testimony of this witness. The next witness will go into more detail into the equipment in the proposed dual completion.

CROSS-EXAMINATION

BY MR. UTZ:

Q Would you give the GOR for the Bone Springs?

A The gas-oil ratio that we obtained from drill stem test was from the upper portion of the upper pay interval 2,030 cubic feet per barrel. From the lower pay interval it was 2,006 cubic feet per barrel.

Q What was the bottom hole pressure in the Devonian?

A Devonian?

Q Yes.

A 6,046 pounds per square inch gauge.

MR. UTZ: Any other questions of the witness?

MR. PAYNE: No questions.

MR. UTZ: The witness may be excused.

(Witness excused)

MR. COUCH: Mr. Bill Howard, take the stand, please.

May the record show that Mr. Tom Webb is area engineer for The Ohio Oil Company at Hobbs, and Mr. Webb, this area is directly under your supervision as an engineer, is it not?

MR. WEBB: Yes, sir, it is.

BILL G. HOWARD,

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

DIRECT EXAMINATION

BY MR. COUCH:

Q Mr. Howard, will you please state your name and by whom you are employed and in what capacity?

A My name is Bill G. Howard G. Howard. I am employed in the capacity of area production superintendent for The Ohio Oil Company with offices at Hobbs, New Mexico.

Q Mr. Howard, have you previously testified before this Commission?

A No, sir, I have not.

Q Will you briefly state your professional qualifications and your experience in connection with oil and gas?

A I was graduated from Texas A & I with a Bachelor of Science degree in petroleum and natural gas engineering in May, '51. Shortly thereafter, I was employed by The Ohio Oil Company in the capacity of petroleum engineer, where I worked as a petroleum engineer in West Texas doing both field and reservoir work. In January, '54 I was promoted to production foreman at Hobbs, New Mexico. In 1956 I was advanced to assistant production superintendent of the Hobbs area where I worked supervising operations in Southeastern New Mexico and extreme West Texas. 1958 I was advanced to production superintendent of the Hobbs area where I'm currently employed in charge of drilling and producing operations in Southeastern New Mexico and extreme West Texas.

Q That, of course, includes this Lea Unit area and this particular well?

A Yes, it does.

Q Well, then, the actual dual completion of this well is going to be under your supervision, is it not?

A Yes.

Q In your present position, that will be your supervision over it?

A That is correct.

Q How is it proposed to dually complete this well? Just describe briefly to us, Mr. Howard, how that will work.

A Referring to Exhibit 3, it may be noted that the well is presently equipped with a Baker Model "D" cast iron production packer set at a depth of 13,940. The well is also equipped with a string of 2 3/8ths OD, EUEN 80 tubing.

Q That packer is set in the production string casing, 7-inch casing, is it not?

A That is correct.

Q How will this Devonian tubing string be equipped at the time that the dual completion is made?

A The Devonian tubing string will be equipped with a Baker Model "C-3" tube and seal receptacle unit and two circulating valves, one above and one below the packer. By unlatching the referred to receptacle, the Devonian string may be removed from the well bore to permit dualling operations in the Bone Springs

interval and at the same time effect complete isolation of the Devonian zone.

Q That portion of the Devonian tubing string below the packer would then remain in the hole, is that right?

A Yes, sir. Referring back to the Exhibit, the receptacle would be unlatched, leaving the latching seal assembly, the tail pipe, and the lower circulating valve, which would be in a closed position, leaving that all intact, which would effect isolation of the lower zone.

Q Now, let's describe briefly about the actual dual completion operation, if you will.

A The Bone Springs interval would be perforated within the interval 9480 to 9646. After testing the Bone Springs, the Devonian tubing string would be re-run, and the receptable latched up. A parallel string of 2 3/8ths OD hydril tubing would then be run to permit production from the Bone Springs Section. Both zones would then be placed on production.

Q All right. Now, you have testified as to the size and type of tubing for both Devonian and Bone Springs both; it would be 2 3/8ths inch OD; 4.7 pound hydril tubing?

A No, sir. The Devonian string would consist of 2 3/8ths OD 4.7 pound EUEN 80 tubing.

Q And the hydril is in the other zone?

A That is correct.

Q All right.

A The Bone Springs would be 2 3/8ths OD hydril.

Q If it happens that tubing is not available, tubing of equivalent size and rating would be used, is that right?

A That is correct.

Q What is the inside diameter of the two types of tubing you are proposing to use here?

A The inside diameter of both strings of tubing is the same, or 1.995 inches.

Q What can you tell us about all of that equipment, its design and proposed installation?

A This entire installation has been designed and will be installed in accordance with sound engineering principles and practices, and will, in my opinion, effectively prevent communication between the two zones of production. Incidentally, this type of installation is in common useage in Southeastern New Mexico today.

Q Do you offhand know the pressure differential which this packer is designed to withstand?

A Yes, sir. This Baker Model "D" packer is designed for a ten thousand pound differential at 300 degrees Fahrenheit.

Q That's substantially more than the differentials expected here, is it not?

A That is correct. We anticipate no differentials even near ten thousand pounds.

Q All right. Now, when you use this type of equipment,

will it be possible to measure reservoir pressure from each of these two reservoirs?

A Yes, sir, it will.

Q By the actual use of a bottom hole pressure gauge?

A Using the previously described equipment, it will be possible to measure the reservoir pressure of each strata separately, using a bottom hole pressure gauge.

Q Will this well be equipped in such a manner as to permit conducting a packer leakage test?

A Yes, it will.

Q In addition to the packer leakage test, tell us what other ways we'll have of observing the effect of this dual completion.

A In addition to packer leakage test, a continuous check on possibly communication between the two zones of production would be automatically provided by the normal operation of the well. Four comparisons between the two zones are as follows: The gravity of the Devonian crude is 55.7 degrees API, whereas the gravity of the Bone Springs crude is 42 degrees API.

Q That's an approximate gravity on the Bone Springs?

A Yes.

Q Gathered from the drill stem tests?

A Yes, those are approximate gravities. The second, the Devonian crude is relatively colorless, whereas the Bone Springs crude is dark in color. Third, the GOR of the Devonian zone is

321, whereas we anticipate a GOR of approximately 1500 to 1 for the Bone Springs Section. Four, the bottom hole pressures of the two zones have a presure differential of approximately 2000 PSIG.

Q What can you tell us about the surface equipment that's to be used on this well when it's dually completed?

A The surface equipment will be such that the oil and gas production from each zone may be separately and accurately measured.

Q Can you give us some information about the possibility of corrosion problems in this dual completion?

A In my opinion, there will be no corrosion problems of any real consequence from either the Devonian or Bone Springs interval.

Q Can you give me the basis of that conclusion, Mr. Howard?

A Yes, sir. This conclusion is based on the fact that Devonian crudes characteristically offer little or no corrosion problems. Also, an analysis of the Devonian gas from the subject well reflected an H_2H content of only .25 percent.

Q That was an actual analysis?

A Yes, sir, it was. Although an analysis of the Bone Springs gas is not available, samples of the Bone Springs crude obtained during a drill stem test operation appear to be only slightly sour.

Q You personally saw some of the Bone Springs crude?

A Yes, sir, I did. That is my personal observation. The gas which was observed during the drill stem test operations and the crude samples obtained from the drill stem test did not appear to be sour. In fact, they were only slightly sour.

Q What is your opinion, as a production man as well as an engineer, on whether artificial lift can be provided if this well is dually completed, when and if it becomes necessary?

A When and if the lift does become necessary, it's my opinion that the production from either zone or both zones simultaneously may be effectively and efficiently lifted by gas lift method.

Q Is there sufficient gas available in the area for gas lift purposes, if needed?

A Yes, sir, there is.

Q All right. Will you describe briefly how this gas lift system would operate?

A Dual gas lift system for lifting the production from both zones simultaneously may be effected by installing gas lift valves in each of the 2 3/8ths OD tubing strings illustrated on Exhibit 3, and installing a packer, a dual string packer, above the Bone Springs Section. With this system, approximately 1000 barrels of fluid per day may be lifted from the Devonian Section along with approximately 500 barrels of fluid per day from that of the Bone Springs zone. The Devonian side of this system would be

continuous lift, and the Bone Springs would probably be intermittent in view of the small volume of fluid we anticipate lifting.

Q Those two volumes that you mentioned are substantially in excess of the current allowable you might expect; isn't that right?

A That is correct.

Q If you needed additional lift capacity from the Devonian, what could you do?

A If additional capacity is desired from the Devonian Section, approximately 1500 barrels of fluid per day may be lifted by utilizing a string of 2 7/8ths OD tubing on the Devonian side. The 7-inch casing, the subject well offers ample clearance to accommodate a string of 2 7/8ths OD hydril tubing and a string of 2 3/8ths OD hydril tubing with each string equipped with gas lift valves.

Q Is this type of dual string gas lift installation being used successfully elsewhere?

A Yes, sir. This type of installation, dual string gas lift installation is being successfully operated in several pools in the Permian Basin.

Q Is it your opinion that both of these zones can be efficiently completed by such a method of artificial lift, if it should become necessary?

A Yes, it is.

Q Now, you talk about gas lift. Does that seem to be to you the most desirable way of lifting, based on what you know now?

A Yes, it appears at this time that gas lift would provide the most desirable means of lifting the production from either zone or both zones simultaneously.

Q Is there some other method that could be used if gas lift proved not to be the best way?

A Yes, sir. If it did prove that gas lift would not be the most desirable method, we could lift the production from either zone or both zones simultaneously by employing a hydraulic pumping system.

Q Now, again, based on your experience as a production man and as an engineer, Mr. Howard, is it true that in this well, minor treatment, minor reworking operations can be accomplished in both these zones after the dual completion has been made, as you have just proposed --

A Yes, sir.

Q -- without disturbing either zone?

A That is correct.

Q You can work through the tubing into each completion on certain types of rework?

A Yes.

Q On a major reworking operation, Mr. Howard, of the Devonian zone, would it be necessary to kill the Bone Springs?

A Yes, sir, it would. Major rework in the Devonian zone

would necessitate killing the Bone Springs zone with mud.

Q You would kill it with mud?

A Yes.

Q In the drilling of this well, of course, there was mud for a good while?

A Yes.

Q Did that seem to adversely affect the Bone Springs zone, insofar as the drill stem test was concerned?

A No. Mud was on the Bone Springs Section for several days during the drill stem test operations of this zone, and it did not appear to adversely affect.

Q So you would anticipate, if you do have to kill the Bone Springs, you would have no serious difficulty getting it back on production?

A That is correct.

Q If you are going to rework the Bone Springs, would you have to kill the Devonian?

A No, sir, you would not. Employing this equipment we've just described, we could do most any work necessary on the Bone Springs without disturbing the Devonian Section. In effect, you would just be shutting it in while you were working on the Bone Springs.

Q The net effect of it would be to shut it in, just substantially like you would shut a well in at the wellhead?

A That is correct.

Q And the packer would remain in place to protect the Devonian while working the Bone Springs?

A Yes, sir. The packer and tailpipe and valve and lower receptacle would remain in place.

Q Considering all that has gone before here, and the testimony and information in this record, Mr. Howard, what is your opinion on whether both zones can be effectively and efficiently produced by the means of this equipment? Can it be done as effectively and efficiently as far as ultimate recovery is concerned with this dual as it would be with two singly completed wells, one to each zone?

A Yes, sir. Production from both of these zones may be just as efficiently effected by the dualling of this well as opposed to drilling twin wells to each zone.

MR. COUCH: That concludes our direct presentation.

CROSS-EXAMINATION

BY MR. UTZ:

Q Mr. Howard, this "C-3" receptacle unit set just above the Model "D" packer, what kind of a valve does it employ to shut off the Devonian? Is it a flapper valve?

A No, sir, the receptacle does not contain a valve. The receptacle is just a seal connection that will permit you to latch or unlatch a string of tubing. The valve is below the packer marked on Exhibit 3 as circulating valve. That valve would necessarily be closed before the receptacle is unlatched.

Q That's a wire line operation?

A Yes, sir, it is.

Q In the event you were going to gas lift, how, again, were you going to get the gas down into the tubing, inject it in the annulus with the packer above the Bone Springs?

A Yes, sir.

Q Then you would be gas lifting the Devonian production from above the Bone Springs?

A Yes, sir. The Devonian tubing string would be valved down to just immediately above the top packer, in the event it was necessary to lift from that depth.

Q The Devonian would have to have enough bottom hole pressure to support something like a six thousand foot column of oil; is that right?

A Not necessarily. We could lift from just immediately above the bottom packer, if it became necessary.

Q How would you get your gas down there?

A We would run a string of 4-inch tubing from the top packer, from below the top packer, down to the lower packer. Then a concentric string of probably 2 1/16th through that same interval. The gas would then be injected into the casing annulus, down the annulus to the top packer where it would travel in the annulus between the 4-inch and 2 1/16th. Of course, that 2 1/16th would necessarily have to be valved also.

Q Yes.

MR. UTZ: Are there other questions?

MR. PAYNE: Yes, sir.

QUESTIONS BY MR. PAYNE:

Q Mr. Howard, from your diagrammic sketch, it appears that you don't propose to use tubing anchors. Is there any particular reason for that?

A I don't believe I follow that question.

Q Well, it looks like your tubing is running free.

A Of course, that's just a diagrammatic sketch. It's drawn as simply as possible. Of course, there would be a Christmas Tree on there with tubing anchors and hangers.

MR. UTZ: Tubing anchors?

A Did you say anchors?

Q (By Mr. Payne) Anchors.

A I am sorry, I thought you meant hangers. Are you referring to top or the --

Q The Bone Springs.

A The Bone Springs. We feel that it would not be necessary to have the tubing hanger on a short string,it would be hanging free as long as both zones were flowing.

MR. PAYNE: Thank you.

MR. UTZ: Any further questions? The witness may be excused.

(Witness excused)

MR. COUCH: I previously offered the Exhibits at the

conclusion of the testimony of Mr. Webb.

MR. UTZ: Without objection, Exhibits 1, 2 and 3 will be entered into the record.

(Whereupon, Applicant's Exhibits 1, 2 and 3 received in evidence.)

MR. COUCH: Also, to perfect the record, I should point out that Mr. Webb has previously testified before the Commission; his qualifications are a matter of record. I assume they are acceptable to the Examiner.

MR. UTZ: Yes, sir, both of them are acceptable.

MR. COUCH: Thank you.

MR. UTZ: Any other statements in this case? The case will be taken under advisement.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter, 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 machine shorthand and reduced to typewritten transcript 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 17th day of August, 1960, 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. 2045, heard by me on Aug. 10, 1960.

Examiner
New Mexico Oil Conservation Commission