

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
MAY 4, 1961

EXAMINER HEARING

PHONE CH 3-6691

IN THE MATTER OF:

CASE 2267 Application of Byard Bennett for permission to :
institute a waterflood project in the Caprock- :
Queen Pool, Chavez County, New Mexico. Appli- :
cant, in the above-styled cause, seeks permiss- :
ion to institute a waterflood project in the :
Caprock-Queen Pool in an area comprising the :
E/2 SE/4 of Section 20 and the SW/4 of Section :
21, all in Township 14 South, Range 31 East, :
Chaves County, New Mexico, by the injection of :
water into the Stella Zimmerman Well No. 2, lo- :
cated in the SE/4 SE/4 of said Section 20. :

BEFORE:

Daniel S. Nutter, 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. NUTTER: We will take next Case 2267.

MR. MORRIS: Case 2267. Application of Byard Bennett
for permission to institute a waterflood project in the Caprock-
Queen Pool, Chaves County, New Mexico.

MR. CAMPBELL: Jack M. Campbell, Campbell & Russell,
Roswell, New Mexico, appearing on behalf of the applicant. I have
one witness, Mr. Swartz.

(Witness sworn)

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GUY A. SWARTZ,

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

DIRECT EXAMINATION

BY MR. CAMPBELL:

Q Will you state your name, please?

A My name is Guy A. Swartz.

Q Where do you live?

A Roswell, New Mexico.

Q What is your profession?

A I'm a consultant geologist.

Q Have you previously testified before this Commission in your professional capacity?

A Yes, sir, I have.

MR. CAMPBELL: Are the witness' qualifications acceptable?

MR. NUTTER: Yes, sir.

Q What is your position or capacity with the Applicant in this case, Byard Bennett?

A In this particular case I am representing him as a technical witness on his behalf on this proposed waterflood unit.

Q Are you acquainted with the properties belonging to Mr. Bennett, that are involved in this application?

A Yes, sir. I have performed several duties in the drilling and completion operations of several of Mr. Bennett's wells, and also on some of the adjacent Gulf Oil Corporation properties.

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(Whereupon, Applicant's Exhibit No.1 was marked for identification)

Q I hand you what has been identified as Applicant's Exhibit No. 1, and ask you to state what that is, please?

A Exhibit No. 1 is a plat which shows Mr. Bennett's lease outlined in red, and the adjacent waterflood units which have been approved and which are now in operation in the immediate area. It also shows an area of approximately two miles around Mr. Bennett's lease, and all the leaseholders and mineral interests.

Q Lying immediately to the south of the lease involved here, is there an approved waterflood project?

A Yes, sir. That is the South Caprock unit, which is operated by Union Oil of California.

Q Is there presently any injection of water in or near the lease boundaries of the Bennett lease?

A To my knowledge, the injection is proceeding several miles to the south of Mr. Bennett's lease, and is rapidly approaching Mr. Bennett's lease.

Q At the time that the injection of water is commenced near the boundary, the south boundary of the Bennett lease, in your opinion, will it be necessary for Mr. Bennett to flood his properties in order to protect his correlative rights?

A Yes, sir, it will be.

Q How many wells are there on this 200 acres

A Mr. Bennett's lease comprises 240 acres, and there are

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six wells included, three of which are proposed to be made injection wells.

Q You stated it contained 240 acres. Isn't it just 160 and an 80? Yes, 240 acres; you are right.

A Yes.

Q And there are six wells on the properties?

A Yes, sir, that's correct.

Q Which wells, if this project is approved, would you propose to use as injection wells, ultimately?

A The Bennett No. 2 Zimmerman, is located 990 feet from the South line and 330 feet from the East line of Section 20, 14, 31; the No. 4 "A" Zimmerman Well, which is located 1650 from the South line and 990 feet from the West line of Section 21; and the Bennett No. 1 "A" Zimmerman, which is located 660 feet from the South line and 1980 feet from the West line of Section 21, 14, 31. These wells were chosen to conform with the pattern which is set throughout the entire Caprock area by the various floods now in force.

(Whereupon, Applicant's Exhibits Nos. 2(a), 2(b) and 2(c) were marked for identification)

Q I hand you what will be identified as Applicant's Exhibit 2 (a), 2 (b) and 2 (c), and ask you to state what those are, please?

A These Exhibits are gamma ray neutron logs which were run on each proposed injection well, and shows the various formations,

with the top of the Queen indicated, and also the various perforations of the pay on the detailed section of each log.

Q Do you have any information with regard to the original potentials of these wells and their production history?

A The subject wells, the six subject wells were completed from the period February 26, 1958 to December 2, 1958. The potentials averaged slightly over 11 barrels per day per well. The wells followed the same pattern in completion and drilling, and approximately 150 feet of surface casing was cemented and circulated in each well. All wells, with the exception of one well, which has $4\frac{1}{2}$ -inch casing, all wells have $5\frac{1}{2}$ -inch casing cemented on bottom with 150 sacks of cement, which offers approximately 1,000 feet of fill-up behind the casing, and each well has been perforated opposite the pay section. All wells were sand fractured with treatments varying between 4,000 and 15,000 gallons, and each well is now producing by pumping method.

Q What is the average daily production from the wells involved in this application?

A The production, since the initiation of drilling operations, have ranged from approximately, well, slightly over 3800 barrels to a present production of 691 barrels per month, which averages approximately 3.8 barrels per well per day. And this is rapidly approaching the estimated economic limit, which would be approximately $2\frac{1}{2}$ barrels per day.

Q Are there any wide variations between the present produc-



ing capacities of the six wells, or are they all in the stripper stage?

A There is some variation between the productive capacity of the wells. The wells in the center of the lease are slightly better than those on either side. This can be seen by the cross-section Exhibit.

Q In your opinion, have these wells on this lease reached their stripper stage?

A Yes, sir, they have.

(Whereupon, Applicant's Exhibit No. 3 was marked for identification)

Q I hand you what has been identified as Applicant's Exhibit No. 3, and ask you to state what that is, please?

A Exhibit No. 3 is a production curve showing the production in gross barrels per month for the combined Byard Bennett leases, the Zimmerman and Zimmerman "A" leases. It has the production plotted in gross barrels, production versus time per month. This production curve shows the steady rate of decline since the early part of 1959 into the present state.

Q Mr. Swartz, in your opinion, is the zone of proposed water injection common and continuous over the area involved here?

A Yes, sir, it is.

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

Q I hand you what has been identified as Applicant's Ex-

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hibit No. 4, and ask you to state what that is?

A Exhibit No. 4 is a structure contour map of this immediate area, and shows the structure on top of the Queen pay in this area. It also shows the proposed injection wells in the immediate area, and the proposed injection wells on Mr. Bennett's lease, which are indicated in red.

Q Does it also show the proposed injection wells on the waterflood project to the south of the Bennett properties?

A Yes, sir.

Q Does this Exhibit tend to confirm your conclusion that the zone of injection is common and continuous throughout this area?

A A cross-section has been constructed from the Union No. 4, which was originally drilled as the Antweil No. 4 Federal, and I believe that will bear that out.

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

Q I hand you that Exhibit, which has been identified as Exhibit No. 5, and ask you to state what that is, and how it tends to confirm your conclusion that the proposed zone for injection is common and continuous throughout this 240 acres?

A Exhibit No. 5 is a cross-section, and includes the wells as indicated on the line AA Prime on the structure contour map, and shows the continuity of pay as shown by the various individual gamma ray neutrons on the noted wells. This cross-

section also shows a thinning or a pinching out of the pay to the west or in this case updip. It might be noted or mentioned that this porosity and permeability pinches out below the normal nitrogen gas cap of the Caprock-Queen Pool in this area.

Q To your knowledge, have waterflood projects in this same pool proved to be successful from the point of view of ultimate recovery and from the point of view of the economics involved?

A Yes, sir. I believe that the waterfloods throughout the Caprock have been considered highly successful to this date.

Q In the event you are granted the authority to initiate this waterflood, where would you obtain your water?

A The water contract, as such, has not been negotiated. Negotiations have been in process, and the water would be obtained either from Mr. Zimmerman, who is the mineral owner on this particular property, or from one of the adjacent waterfloods, which do have excess water available.

Q Do you anticipate there will be any difficulty obtaining a sufficient amount of water to flood this 240-acre area?

A No, sir.

Q How much water do you consider may be required?

A It has been proposed to inject approximately 300 barrels of water per well per day, or between 900 and a thousand barrels of water per day.

Q In the event this application is approved, when would you contemplate initiating the injection of water?

A The initiation of injection would probably not proceed until such time as the adjacent flood to the south projected and began injection, forcing some action on this lease.

Q In other words, you anticipate that this particular waterflood project will be, in effect, a defensive operation, and that you will not immediately begin the injection of water and trigger the project to the south?

A Yes, sir, that's correct.

Q In the event the application is granted, and you do inject water and obtain waterflood production, are you prepared to comply with the provisions of Rule 701 of the Commission in connection with the limitation upon allowables?

A Yes, sir.

MR. CAMPBELL: I would like to offer Applicant's Exhibits 1 through 5.

MR. NUTTER: Applicant's Exhibits 1 through 5 will be entered in evidence.

(Whereupon, Applicant's Exhibits 1 through 5 were received in evidence)

MR. CAMPBELL: That's all the questions I have at this time.

MR. NUTTER: Does anyone have any questions of Mr. Swartz?

MR. MORRIS: No, sir.

CROSS-EXAMINATION



BY MR. NUTTER:

Q Mr. Swartz, first of all, which is the "A" lease, and which is the "B?"

A I'm sorry. The Zimmerman lease is the east half of the southeast quarter of Section 20, 14, 31, and the Bennett Zimmerman "A" lease is the southwest quarter of Section 21, 14, 31, all in Chaves County, New Mexico.

Q Now, the two wells on the Zimmerman lease are producing at what rate at the present time, Mr. Swartz?

A I don't have the present production figure exactly on that. They are producing at a very low rate, however,

Q How about the GORs on those two wells? Are they comparable with the GORs on the wells on the Zimmerman "A" lease?

A The gas produced on either lease from each well is too small to measure in each case.

Q So you haven't penetrated the gas cap or any highly saturated gas sands with any of these wells?

A No, sir.

Q The gas cap must lie farther to the west?

A It is believe that in this particular case that the porosity and permeability pinch out to the west before any gas cap is encountered. I believe in this area that the gas cap is at a sea level datum of approximately 1450, 1445 or 1450. It's in that vicinity, which is just about off this structure contour map.

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Q Quite a ways to the west, then?

A Yes, sir.

Q I think you referred to it as the Union No. 4 Well --

A Yes.

Q -- the westernmost well on your cross-section?

A Yes. It was drilled originally as the Morris and the Well No. 4 Yates Federal.

Q Did that just find a real tight sand, or did it encounter gas?

A No, sir. It encountered a very thin zone of possibly pay, and they elected to plug the well rather than to complete it, because of the pay being too thin for commercial development.

Q How about permability? Do you know about what that encountered there?

A So far as I know, they had no shows, to speak of. I can count about a foot and a half on a gamma ray neutron log.

Q So it was evidently a pinchout of the porosity --

A Yes, sir.

Q -- that they encountered there. You believe that this same pinchout extends along the west side of the Zimmerman lease, then?

A Yes, sir. In the northeast of the northwest quarter of Section 20, there is also a dry hole which was the Hodge No. 1 Malco Federal, and to my recollection that well had approximately one to one and a half foot of pay. The pay thickness increased

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steadily to the east, and, as I recall, it was approximately 22 feet thick in the Gulf No. 2, which is located in the northeast of the northwest quarter of Section 21, 14, 31.

Q You mentioned the conversion of three wells, being the Zimmerman No. 2, and the A-1 and 4 to water injection. However, in this application you are only requesting authority for the one well, is that correct?

A Yes, sir.

Q The Zimmerman 2?

A At the time the application was made, it was thought that it would be best to see if the zones would respond adequately to water injection. However, because of the various rates of efficiency of the one well injection as against a five spot program, it was felt that perhaps it would be better to ask for the approval of all three wells to conform with the adjacent lease to the south, and thereby afford a little better protection to the mineral interests.

Q You are aware that the advertisement of this case limits the scope of the thing to the injection of water into the Stella Zimmerman No. 2 Well?

A Yes, sir. That will probably be the initial process.

Q Has Mr. Bennett discussed this proposed water injection program with Union California Company, the operator to the south?

A I believe they are cognizant of this.

Q Has the agreement between those two parties, Mr. Bennett

and Union, been such that Mr. Bennett won't commence injection of water until such time as Union's flood has proceeded up into this northern area of the south Caprock unit?

A I don't believe that there has been any definite arrangement worked out, but Mr. Bennett will probably not inject water until he is offset and forced to. It's a little difficult at the present time to foresee the time of development of the south Caprock unit to this area adjacent to Mr. Bennett's lease.

Q Now, the Drickey unit, which is to the northeast, is presently on water injection, is it not?

A Yes, sir.

Q Is that the Cities Service unit?

A Yes, sir, it is.

Q Then, there seems to be a zone in between Mr. Bennett's acreage and the Cities Service unit, which doesn't belong to any unit, is this correct?

A That is correct.

Q Are you aware of any plans for the injection of water in that zone between Mr. Bennett's acreage and the Cities Service unit?

A To my knowledge, there have been several proposed units. However, in this area, I believe that both Continental and Phillips entertain programs on units in this area. However, to my knowledge, neither of these, the area to the north or to the southeast, have been unitized at this present time. There hasn't been any definite

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plan formulated as yet.

Q And you don't have the individual production records of the wells on these two leases?

A No, sir. I can obtain those.

Q I think our records will have that production. Now, Mr. Swartz, I notice on the logs of the three proposed injection wells, the surface pipe on the No. 4-A is shown to be at 154 feet.

A That's probably correct.

Q That is Exhibit 2 (a)?

A Yes, sir.

Q How much cement was used on that string of surface pipe?

A I believe that in each well, each well on either lease, 150 sacks was the amount of cement used.

Q On surface pipe as well as long string?

A No, sir. I'm sorry about that. On the surface casing, I don't have the exact figures of the amount of cement used. However, in each case, the surface pipe was circulated.

Q Okay. Now, on the 4-A, then, we have 454 feet of surface pipe circulated?

A Yes, sir.

Q And I think this log indicates there's 2910 feet of $5\frac{1}{2}$ -inch pipe. Would that be correct?

A On the Commission form, as filed, it was shown as $5\frac{1}{2}$ -inch casing at 2911.

Q We won't quibble about a foot. And 150 sacks?

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A In this particular case, it was 125 sacks.

Q Do you have a top for that cement?

A No, sir. I have calculated there would be, on 125 sacks, there would be approximately 900 feet fillup.

Q Calculated fillup 900 feet. Now, on the Zimmerman 1-A, the log doesn't give the surface pipe. Could you give me the surface pipe and the cement used there or the top of the cement?

A Yes, sir. On the 1-A, 8 5/8-inch casing was set at 165 feet, and in this particular case, 150 sacks of cement was used.

Q Was that circulated?

A Yes, sir.

Q And the long string, the 5 1/2?

A The 5 1/2-inch casing was set at 2933, and in this case, 125 sacks were used.

Q What's your calculated fillup there?

A Approximately 900 feet.

Q Now, in the case of the Zimmerman No. 2 Well, the surface pipe is indicated as 156 feet, is that correct?

A That is correct.

Q Cement circulated?

A Yes, sir.

Q How about the production string?

A The production string was 5 1/2-inch casing set at 2879 feet with 150 sacks.

Q What's your calculated fillup behind the pipe?

A I believe that's 970 feet, as I recall.

Q 970?

A I believe that's correct. It would be approximately that.

MR. NUTTER: Are there any other questions of Mr.

Swartz? He may be excused.

(Witness excused)

MR. NUTTER: Do you have anything further, Mr. Campbell?

MR. CAMPBELL: No, sir.

MR. NUTTER: Does anyone have anything they wish to offer in Case 2267? We'll take the case under advisement, and recess the hearing until 1:30.

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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 7th day of May, 1961, 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 correct record of the proceedings in the Examiner's hearing of Case No. 2267, heard by me on 5.4, 1961.

[Signature], Examiner
 New Mexico Oil Conservation Commission

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