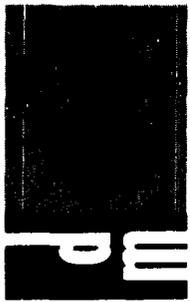


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BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
June 5, 1968

EXAMINER HEARING

-----)
 IN THE MATTER OF:)
)
 Application of Shenandoah Oil)
 Corporation for a waterflood)
 project, Eddy County, New Mexico.)
)
 -----)

Case No. 3779

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

MR. NUTTER: We will call next Case 3779.

MR. HATCH: Application of Shenandoah Oil Corporation for a waterflood project, Eddy County, New Mexico.

MR. JENNINGS: James T. Jennings of Jennings and Copple, Roswell, appearing on behalf of Shenandoah Oil Corporation. I have one witness, Mr. T. P. Bates.

(Witness sworn.)

(Whereupon, Exhibits A through E were marked for identification.)

PAT BATES

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

DIRECT EXAMINATION

BY MR. JENNINGS:

Q Would you state your name and occupation, please?

A My name is Pat Bates. I am supervisor, secondary operations, for Standard Oil Corporation.

Q Have you previously appeared and testified before the Commission and had your qualifications accepted?

A Yes, I did, in I believe November 1966.

MR. JENNINGS: Do you wish me to further qualify the witness?

MR. NUTTER: No, the witness is qualified.

Q (By Mr. Jennings) Mr. Bates, this is an application filed on behalf of Shenandoah Oil Corporation to institute a waterflood project by the injection of water into the Yates, Seven Rivers, Queen and Grayburg formations through five injection wells. Where are these wells located and what pool?

A These five wells are located in the Shugart Pool, Eddy County, New Mexico, and the five wells are the Shugart A No. 8, which is located in the Southwest Quarter of Section 29, Township 18 South, Range 31 East; the Shugart D No. 1, located in the Southwest Quarter of the Northeast Quarter, Section 30, Township 18 South, Range 31 East; the Shugart D No. 8, located in the Northeast Quarter and the Northeast Quarter, Section 30, Township 18 South, Range 31 East; the Shugart C No. 3, located in the Northeast Quarter, Southeast Quarter, Section 30, Township 18 South, Range 31 East; the Kenwood Federal No. 3, located in the Southeast Quarter, Northwest Quarter, Section 29, Township 18 South, Range 31 East.

Q What is the present status of production from these wells?

A The average daily production per well is approximately five barrels.

Q Are they continuing to decline?

A They are declining slowly now. They're leveling off at the present time.

Q Do you feel that waterflooding any of the zones where the wells are completed would be beneficial and result in ultimate recovery of additional oil?

A Yes.

Q In what zones are the wells producing from generally?

A Well, of course, the wells are producing at different intervals perforated but some of the wells are producing from the Yates, Penrose and Middle and Lower Grayburg formations.

Q Do you feel that these zones are susceptible to flood?

A Yes, I do, there are other floods in the immediate vicinity of this project.

Q What are they and where are they?

A Well, the Grace Smith Shugart 18 Queen Unit is located north and slightly west of this project and the Atlantic Kuhlman Queen Unit is located southwest of the proposed project.

Q Are there other proposed floods in the immediate vicinity also?

A I understand that there are other floods, one by

J. J. Travis, which is located in Section 21.

Q Have you made any effort to either communitize the area or to work out some deal with your offset operators in connection with your proposed flood?

A Yes, I have. I have contacted both verbally and by letter Chambers and Kennedy and Union of California, of which both are located to the south of this proposed unit, and also with Mr. Jack McClellan, who has three wells located in Section 19 just north of this unit.

Q What is the status of your negotiations?

A At the present time they have informed me that they will offset us there with injection wells. Union of California has agreed to place their F-1 well on injection located in Section 31, and the Chambers and Kennedy have tentatively agreed to place their No. 3 well in Section 32 on injection. These are direct offsets south of our C and A lease.

Q How do you propose to flood the area?

A At the present time we are planning on separating each one of these zones where possible by use of packers, and flow nipples down-hole, whereby we can control water into each zone, the amount of water.

Q Have you made arrangements for a water supply?

A Yes. Water supply is available. There is a

commercial water line crossing our lease, and we have made contact and will probably work up an agreement with them.

Q How much water do you propose to inject, Mr. Bates?

A Initially, whereby we have one well, the A No. 8, which will be completed in the Yates only, we propose to inject approximately 350 barrels per day into that well, and where we have three zones completed in a well we expect to inject approximately 200 barrels per day per zone per well. So it would be a total of 600 barrels per day.

Q Where do you plan to install your facilities, or have they been installed?

A No. No facilities have been installed yet. Our plans are to install waterflood facilities near our A No. 1 well, located in Section 29, and this water plant will be set up to take care of all produced water, to treat and recycle this water.

Q What is your expected recovery, Mr. Bates?

A We expect one to one ratio to primary, or approximately a million barrels.

Q What has been the primary?

A That's 1,060,219.

Q That is reflected by Exhibit E?

A Yes. And that's to 1-1-68.

Q Mr. Bates, I hand you here what has been marked as Exhibit A and will ask you to identify it and tell just what it is and what it reflects.

A Exhibit A is a plat showing the location of the proposed project relative to the ownership of all other leases within a two-mile radius and which are producing from one or more of the same geologic formations. Our area is bounded with yellow and I might add that these are all Federal leases with the exception of our State Y lease, located in the Northeast Quarter of Section 32.

Q Approximately how many acres does this embrace?

A Just under 1900 acres.

Q The entire area?

A Yes.

Q How many producing wells do you now have in the area?

A We have 36 active producing wells.

Q Mr. Bates, I hand you what has been marked as Exhibit B and ask you to identify that and state what it reflects.

A Exhibit B is a plat showing the pilot injection wells in the proposed field pattern. The proposed pilot wells are those wells which are connected with the solid line and the wells are circled with a solid line. The dashed

line connecting the other well are the proposed field pattern.

Q This reflects the five proposed injection wells?

A Right.

Q I hand you what has been marked Exhibit C and ask you to state what that reflects.

A Exhibit C is a diagrammatic sketch of a proposed injection well showing the tops of cement, perforations and depths. I have listed on Exhibit C Wells A-8, D-1, D-8, C-3 and Kenwood Federal 3. Would you like for me to go down this?

Q I think if you could briefly tell us what the casing program is, it would be helpful.

A The Shugart A No. 8 has 27 feet of 8-5/8ths casing and that was, and the cement was circulated with ten sacks. It has 2692 feet of 4-1/2-inch casing and was cemented with 250 sacks of cement. The well is perforated at 2590 to 2610; total depth being 2692. In this particular well it's completed in the Yates and it is expected that a tension packer will be set near the shoe and injection will be down internally-coated plastic-coated tubing.

The Shugart D No. 1 has 763 feet of 8-5/8ths casing set with 110 sacks. It has 3808 feet of 5-1/2-inch casing set with 125 sacks. This well is perforated from 3387 to

3404, 3620 to 3630, 3761 to 3777. This well was drilled at a total depth of 3808 feet. As noted here, this is one of the wells where that three zones will be isolated by the use of flow valve arrangement.

Shugart D No. 8 has 755 feet of 8-5/8ths casing cemented with 75 sacks, has 3835 feet of 5-1/2 casing, cemented with 175 sacks. This well is perforated from 3418 to 3426, from 3466 to 3476, 3760 to 3778, and has a total depth of 3850.

Shugart C No. 3 has 757 feet of 8-5/8ths casing, cemented with 75 sacks, 3751 feet of 5-1/2 casing cemented with 100 sacks; perforated from 3640 to 3656, at a total depth of 3804.

Kenwood Federal No. 3, 750 feet of 8-5/8ths casing, cemented with 50 sacks, 3895 feet of 5-1/2 casing cemented with 150 sacks. This well is perforated from 3774, I don't have the original, and it looks like our copy machine shorted us a little bit there, so I don't have that last --

MR. NUTTER: Have you got it marked on the logs?

THE WITNESS: I don't have it marked on these logs.

MR. NUTTER: You can furnish us this perforated interval.

THE WITNESS: All right.

MR. NUTTER: It's not on any of these here.

THE WITNESS: I will mail the perforations in on Federal Number 3.

Q (By Mr. Jennings) Mr. Bates, I hand you what has been marked Exhibit D and ask you to identify that, please.

A Exhibit D is a tabulation of cementing data on these wells.

Q Have you generally testified about this data in your testimony concerning Exhibit D?

A Yes. That's in Exhibit --

Q Exhibit C?

A Right.

MR. NUTTER: I think while you are on that exhibit, Mr. Bates, one part of Exhibit D that you did not testify to would be the calculated top of the cement, if you could go through that for each of these strings of the pipe.

A In the Shugart A No. 8, on the surface at 27 feet of 8-5/8ths, 10 sacks of cement was used. The theoretical fillup per foot per sack, 7.87, it showed to have circulated. On the oil string, which is 4-1/2 casing at 2692, cemented with 250 sacks, theoretical fillup per foot per sack is 10.71, and it showed to be 16 feet.

Shugart C-3, 8-5/8 casing at 757, whereby 75 sacks

were used. Theoretical fillup, 7.87 feet per sack, calculated to be 173 feet. The 5-1/2 casing set at 3751 with a hundred sacks, theoretical fillup feet per sack, 10.75; calculated top, 2676.

Shugart D No. 1, 8-5/8ths casing set at 763 feet with 110 sacks, fillup is 7.87 feet per sack and showed as circulated. 5-1/2-inch casing is set at 3808 with 125 sacks, and calculated top of cement was 2,465 feet.

Shugart D No. 8, 8-5/8 casing set at 755 feet with 75 sacks; calculated top of cement, 173 feet. 5-1/2-inch casing at 3835 with 175 sacks; calculated top of cement, 1954.

Kenwood Federal No. 3, 8-5/8ths-inch casing set at 750 feet, 50 sacks; calculated top of cement, 357 feet. 5-1/2-inch casing at 3895 with 150 sacks; calculated top, 2,283 feet.

Q Mr. Bates, is it contemplated that additional wells will be placed on injection as the flood progresses?

A Yes, and probably as Exhibit B shows the field pattern, I think these will be the wells that will be placed on injection later.

Q Do you desire to obtain administrative approval to place these additional wells on injection?

A Yes, we do.

Q Mr. Bates, do you have logs of the wells, of all the injection wells?

A Yes, I have a set of logs. Two sets, in fact, of all the initial injection wells.

MR. JENNINGS: We have and will offer either as an exhibit or to the Commission the tendered logs on each of the injection wells. If you would mark these, please.

(Whereupon, Exhibit F
was marked for
identification.)

Q (By Mr. Jennings) Mr. Bates, I hand you here what has been marked as Exhibit E and ask you to identify that and state what it reflects.

A Exhibit E is a monthly performance curve that includes the cumulative production for the project and also, in addition, shows the number of producing wells in this unit.

Q I believe you have already testified as to the cumulative production shown by this?

A Yes. It's reflected on this exhibit.

Q Mr. Bates, do you feel that this program, this waterflood program will prevent waste and result in the ultimate recovery of additional oil?

A Yes, I do.

Q Were Exhibits A through E prepared by you or under your supervision?

A Yes, they were prepared by me.

Q As to Exhibit F, the logs, by whom were they prepared?

A The logs were obtained -- You want the name of the company that ran the logs?

Q Yes.

A The Shugart A No. 8 log was run by the Lane Wells Company; the Shugart C No. 3 was the Lane Wells Company; Shugart D No. 1 by the Lane Wells Company; Shugart D No. 8, the Lane Wells Company; Kenwood Federal No. 3 by Log Core, Inc., Artesia.

Q When do you contemplate beginning your flooding operations, assuming that the Commission authorizes this, Mr. Bates?

A We should begin within 90 days.

MR. JENNINGS: We would like at this time to offer Exhibits A through F, and we have nothing further to offer.

MR. NUTTER: Applicant's Exhibits A through F will be admitted in evidence.

(Whereupon, Exhibits A through F were offered and admitted in evidence.)

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

MR. JENNINGS: Mr. Examiner, excuse me, one further question.

Q (By Mr. Jennings) Mr. Bates, have you sought and obtained the approval of the United States Geological Survey as to your proposed flooding operation?

A Yes, that's right. We have, and have obtained approval from them.

MR. JENNINGS: For the record, I believe the Commission has received advice of this approval direct.

MR. NUTTER: Yes. If we have, it's not in the case file, Mr. Jennings.

MR. JENNINGS: We will offer that.

MR. NUTTER: Is that your original copy?

MR. JENNINGS: We have a copy. Would you mark this?

(Whereupon, Exhibit G
was marked
for identification.)

Q (By Mr. Jennings) I hand you here a letter dated May 29, 1968 and ask you to identify that.

A This is a letter from Shenandoah Oil Company to United States Geological Survey in Artesia, New Mexico, requesting approval to initiate a waterflood project as set

forth in this application. In this letter they have agreed to this in its entirety.

Q Is this letter of May 29, the original copy of which is Exhibit G?

A Right.

MR. JENNINGS: We would offer Exhibit G.

MR. NUTTER: Applicant's Exhibit G will be admitted in evidence.

(Whereupon, Exhibit G was offered and admitted in evidence.)

MR. JENNINGS: We have nothing further.

CROSS EXAMINATION

BY MR. NUTTER:

Q I believe you testified that the producing zones here in these wells are the Yates, Penrose and Middle and Lower Grayburg?

A Yes, that is correct.

Q Now, this Shugart A-8 has perforations 2590 to 2610, that would be in the Yates?

A Yes, sir.

Q That's the only perforations this has is in the Yates formation?

A Yes, that's right.

Q Why don't you refer to your Exhibit C, Mr. Bates, and then we can go through and identify these various zones that are perforated in these wells.

A All right. I would like to add also that there are some zones that have not been opened and we are planning on running logs and reinterpreting this entire pay section, and there may be some additional perforations later. This is where the wells are completed at the present time and we haven't done anything with them.

Q Just for the present perforations so I can get an idea where these formations are, now we had the A-8 perforated in the Yates. Now, the next well on your Exhibit C is Shugart D-1, this set of perforations, thirty-three to thirty-four hundred, that would be the Penrose?

A Penrose, that is correct.

Q The 3600 group of perforations are the Middle Grayburg and the other group, the thirty-seven would be the Lower Grayburg?

A Yes, sir. Then on the Shugart D No. 8 --

Q One second please. And the D-8, sir?

A The D-8, this has an additional zone, a lower zone in the Penrose sections.

Q You have two sets of perforations in the Penrose?

A Yes, 3418 to 3426, and 3466 to 3476.

Q And then your Lower Grayburg?

A Lower Grayburg, 3760 to 3778. Then we have the Shugart C No. 3; one set of perforations in this well, 3640 to 3656, which would be the Middle Grayburg. Again, we are cut out on this Kenwood Federal No. 3.

Q And you do propose to open the Penrose?

A I think that we probably will, yes, sir.

Q In this C-3, which would be up around 3400, probably?

A Yes, correct.

Q Then your fifth well on here is the Kenwood, and these are the two Grayburg sections?

A Yes, sir. These are the -- Here's what we call maybe an Upper-Lower Grayburg, 3774, and I will send this information along with the other.

Q For the A-8, which is in the Yates only, you will inject about 350 barrels of water per day, and in the multiple zone it will be 200 barrels per zone per day?

A Yes, sir, that is correct.

Q What is the arrangement for using these Baker flow valves, Mr. Bates? You have one string of tubing and the flow valves are installed on that string of tubing, is that right?

A Yes, sir. I have diagrams here showing dual zone completions sketches and triple completions which we would like to make an exhibit.

Q That might simplify the testimony here.

(Whereupon, Exhibit H
was marked for
identification.)

Q For the triple zone type of completion, which is on the right-hand side of this exhibit, Mr. Bates, --

A Yes.

Q -- will you use the one to the left or the one to the right? In other words, will you have a packer on top of your uppermost flow valve?

A I will use the one on the extreme right. I will not inject behind the casing on the top zone.

Q In other words, we are going to have the annulus isolated in each of these wells?

A That is correct.

Q Will this annulus be loaded with an inert fluid?

A Right, and with a pressure valve installed.

Q With a pressure valve?

A Yes.

Q Now, in the case of the single completions, the Shugart A-8, you will have a packer set immediately above the

shoe and that will be similarly equipped with the annulus loaded and a gauge installed?

A That is correct. It will have a gauge installed to surface, and loaded.

MR. NUTTER: I believe that's all I have. Does anyone have any questions of Mr. Bates? He may be excused.

(Witness excused.)

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

MR. JENNINGS: No. I thought we ought to offer Exhibit H.

MR. NUTTER: Applicant's Exhibit H will be admitted.

(Whereupon, Exhibit H was offered and admitted in evidence.)

MR. NUTTER: Does anyone have anything further they wish to offer in Case 3379? We will take the case under advisement.

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