

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
August 10, 1960

EXAMINER HEARING

IN THE MATTER OF:)

Application of Rice Engineering & Operat-)
ing, Inc. for an order authorizing a salt)
water disposal well. Applicant, in the)
above-styled cause, seeks an order author-)
izing the disposal of produced salt water)
through its Gladiola SWD Well No. H-5,)
formerly known as the Sinclair Kendrick)
Estate Well No. 3, located 1980 feet from)
the North line and 660 feet from the East)
line of Section 5, Township 12 South,)
Range 38 East, Gladiola Pool, Lea County,)
New Mexico, with injection to be in the)
Devonian formation in the interval from)
12,223 feet to 12,500 feet.)

Case 2048

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

MR. UTZ: Case 2048.

MR. PAYNE: Application of Rice Engineering & Operating,
Inc. for an order authorizing a salt water disposal well.

MR. KELLAHIN: If the Commission please, Jason Kellahin,
Kellahin and Fox, Santa Fe, representing the applicant. We will
have one witness, Mr. Abbott.

(Witness sworn.)

MR. UTZ: Any other appearances in this case?

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MR. ABBOTT: No.

W. G. ABBOTT

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A My name is W. G. Abbott.

Q By whom are you employed and in what position, Mr. Abbott?

A I'm a Division Manager for Rice Engineering & Operating, Inc. at Hobbs, New Mexico.

Q Have you testified before the Oil Conservation Commission as a petroleum engineer and had your qualifications accepted?

A Yes, sir.

MR. KELLAHIN: Are the witness's qualifications acceptable?

MR. UTZ: Yes, sir, they are.

Q Are you familiar with the application in Case 2048?

A Yes, sir.

Q Would you state briefly what Rice Engineering proposes under this application?

A We propose to recomplete the Sinclair Kendrick Estate No. 3 Well in the Gladiola Pool, Lea County, New Mexico, as a salt water disposal well. This will then be called Gladiola SWD

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Well H-5. This well is located 1980 feet from the North line and 660 feet from the East line of Section 5, 12, 38. It was originally completed as a marginal producer by Sinclair, October 9th, 1957, and is now temporarily abandoned.

(Rice Engineering's Exhibit A, marked for identification.)

Q Referring to what has been marked as Exhibit A, would you discuss the information shown on that exhibit?

A Exhibit A is a map of this Gladiola Pool, and on this map we have drawn in red a half mile radius circle around the Sinclair Kendrick Estate No. 3 Well and also there's a trace of a cross section AA₁ marked on this exhibit.

Q Are there other salt water disposal wells in the area of the proposed disposal well?

A Yes, sir. We have previously recompleted two wells, salt water disposal wells. They are SWD F-7, which was previously the Gulf Oberholtzer No. 2 and the SWD G-8 which was previously the Lowe Oberholtzer No. 2. Those are marked by symbols on this plat.

Q Are both of those wells being utilized for disposal of salt water as proposed in this application?

A Yes, sir, they are.

(Rice Engineering's Exhibit B marked for identification.)

Q Now, referring to what has been marked as Exhibit B,



will you discuss that exhibit, please?

A Exhibit B is a diagram showing the casing program and the proposed workover program on this well. It shows the 13-3/8 inch surface pipe set at 303 feet with the cement circulated. The 8-5/8 inch set at 4512 feet, and also the cement is circulated behind that string. The 5-1/2 inch casing is set at 11,317 feet. We propose to set a liner, a 4-1/2 inch hydril liner at 11,953 feet. The top of it, and the bottom of the liner, will be at 12,223 feet. We'll deepen the well to a new total depth of 12,500 feet. Running this liner will protect the oil-producing interval in the Devonian zone.

Q Will that liner be cemented in?

A Yes, sir.

Q According to Exhibit B, you propose to inject water through tubing, is that correct?

A No, sir. At the present time we do not propose to use tubing, although we plan to run a caliper survey on this casing before we inject any water and then re-examine it later to see if there's any evidence of corrosion.

Q Is this the same type of completion which is used in the other two disposal wells in the vicinity, which you mentioned?

A Yes, sir.

Q You are not using tubing in those wells, is that correct?

A No, sir. At the present time we are, in fact we have it

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set up to run another caliper survey tomorrow on our SWD F-7.

That's the West well in the system.

Q Are there any fresh water zones in this area?

A The fresh water, there are some fresh water zones above the depth that the surface pipe is set.

Q That would be above the 303 feet?

A Yes, sir.

Q In your opinion, is this type of completion adequate to prevent any damage to those fresh water zones?

A Yes, it is.

Q Is it adequate to prevent any encroachment of salt water in any producing zones that might be encountered?

A Yes, sir, we believe it is.

(Rice Engineering's Exhibit C marked for identification.)

Q Now, referring to what has been marked as Exhibit C, will you discuss that exhibit?

A Exhibit C shows this cross section that was previously marked on Exhibit A as AA₁. It's more or less a North-South cross section running from our SWD G-8 up North through the proposed SWD H-5 and North to the Lowe Markham State No. 1 Well. This exhibit shows the top of the Devonian in red and also the producing interval of the oil wells in red. In green we show the proposed injection interval of the SWD H-5.



Q Also in green is shown the present injection interval of your SWD D-8, is that right?

A Yes, and we have also marked the oil-water contact on this exhibit as minus 8150.

Q All of these wells are producing from the Devonian formation as shown on this cross section?

A Yes, sir.

Q That is the same formation which you propose to inject water?

A Yes.

Q What precautions will you take to insure that no oil will be lost as a result of this injection?

A Well, the first thing we do, we set the liner and then when we drill out to total depth, after we set the liner, we propose to take a drill stem test. With that drill stem test we can determine if there is any oil present. We have previously done that to the other two disposal wells and also in that drill stem test we recorded the bottom hole pressure and we have noticed that this producing interval has higher bottom hole pressure corrected to the field datum than the producing interval, and although we think there's communication between that and the producing interval, it's not direct communication.

Q Now, referring to what has been marked as Exhibit D, would you discuss that exhibit?



(Rice Engineering's Exhibit D
marked for identification.)

A Exhibit D shows the completion interval and all the pertinent data on the wells within this half-mile radius circle that's drawn on Exhibit A. It shows the operator of the lease, the well number, the completion interval subsea, and the completion zone.

Q Mr. Abbott, in your opinion will the injection of salt water, as you propose in this disposal well, cause any damage to these producing wells?

A No, sir, it won't.

Q Will it cause any damage, in your opinion, to any other wells that may be in the area?

A No, sir.

Q The subject well is the property of Sinclair Oil and Gas Company, is it not?

A That's right.

Q Do you have an agreement with them for the utilization of the well?

A Yes, sir.

Q What is the source of the water proposed to be injected in this well?

A The water will be the Devonian waters that are produced in the Gladiola Pool. I think there is some Wolfcamp water, but



it's very small.

Q Are the Devonian wells making any quantities of water?

A Yes, sir, they are making quite a large volume of water.

Q What volume of water do you propose to inject into this well?

A We have shown on our application approximately 15,000 barrels per day.

Q In your opinion, will the formation take that volume of water?

A Yes, sir.

Q Will the disposal well, as you propose to complete it, handle that volume of water?

A Yes, it will.

Q Is that one of the reasons you prefer not to use a tubing method of injection?

A That's right. It's pertinent that we get rid of the water at the present time and if we find that there is corrosion in the 5- $\frac{1}{2}$ inch casing, then it will be necessary to run a tubing string that would cut down the capacity of the well and it would be necessary to have more disposal wells.

Q Are you willing to make any tests which may be required by the Commission to assure that no leakage is occurring in this well?

A Yes, sir.



Q Do you have anything further to add to your testimony?

A No, I believe that's all.

Q Were Exhibits A, B, C and D prepared by you or under your direction and supervision?

A Yes, sir.

MR. KELLAHIN: I would like to offer in evidence Exhibits A, B, C and D.

MR. UTZ: Without objection, Exhibits A through D will be entered into the record.

MR. KELLAHIN: That's all the questions I have, Mr. Utz.

CROSS EXAMINATION

BY MR. UTZ:

Q What was the number of the Gulf Oberholtzer well?

A That's the Oberholtzer No. 2.

Q What do you call it now? A SWD F-7.

Q F?

A Yes. We name the wells for the unit letter in the section and then the section number.

Q Are the F-7 and G-8, were both approved after hearing, were they not?

A Yes, sir.

Q They're completed just like this proposal?

A Yes, they are.

Q How old are those two wells?



A I believe the F-7, that's the first well that we completed, I think it's around nine months.

Q How about the G-8?

A The G-8 I believe is around five months.

Q Do you think this type of completion is as practical and foolproof and safe as one using tubing?

A No, we don't think so. That is why we want to determine if there's any corrosion evidenced in the casing, because we realize that if something happened to the disposal well, it would be very costly for the operators and also we don't want to have anything happen to the producing zone.

Q Why are you proposing this type of completion then if you don't think it's as safe as the other type?

A We propose to run these tests periodically and if there is any evidence of corrosion, then we will run the tubing strings. We need the capacity, the full capacity, the 5- $\frac{1}{2}$ inch casing at the present time, but will determine in a very short time if there is any corrosion in the F-7 well. If there is, well, we will run a tubing string to protect the casing.

Q The operators participate in the cost of these completions, do they not?

A Yes, sir.

Q That might be the reason?

A Yes. Well, a tubing string for one of these wells would

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cost approximately \$10,000, but if there is damage to the casing we will recommend that we run this tubing.

Q How effective is a caliper survey as far as finding pits and pot marks?

A We think it's fairly good, especially where you run a caliper survey and then come back in a certain length of time and run another one and then we can compare the two and the service companies can work with us to determine if there's any corrosion in the casing.

Q Can't a caliper survey miss small holes quite easily?

A It could miss some of them, but they're making them so foolproof that we believe it's the best method devised yet to study the inside of the casing.

Q Does this tell you anything about the outside of the casing?

A No, sir.

Q I believe you testified that you would be willing to run any tests required by the Commission. Upon completion of this well, would you be willing, provided the Commission approves it, would you be willing to pressure test the casing at 2,000 pounds surface pressure with the hole full of water?

A If that doesn't exceed the test on the casing we would, yes. We plan to test the casing with a thousand pounds for thirty minutes after we cement the liner and before we drill out

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to determine if we have a good liner job.

Q What do you mean doesn't exceed the test of the casing, you mean the 5- $\frac{1}{2}$ inch wouldn't test that much?

A Well, that's with a hole full of fluid, that's a tremendous pressure to exert on the bottom hole.

Q What is the test strength, is 5- $\frac{1}{2}$ inch twenty pound?

A It's seventeen and twenty pound. It should stand that pressure.

Q New casing will stand over 4,000 pounds, won't it?

A Yes.

Q So, at 12,000 feet you have approximately 6,000 pounds of pressure plus the 2,000 pounds above would be 8,000 pounds, wouldn't it?

A Yes.

Q That ought to be a pretty good test. Now, between the top of the 4- $\frac{1}{2}$ liner and the bottom of the 5- $\frac{1}{2}$ casing, you have a cement column of 51 feet, is that correct, the liner is 11,953?

A Yes.

Q The bottom of the 5- $\frac{1}{2}$ is 12,014?

A Yes.

Q How much space will there be in the annulus? In other words, the thickness of the cement column between the 5- $\frac{1}{2}$ and the 4- $\frac{1}{2}$?

A It's very thin. I don't remember what it is. It is a



very thin sheath right inside the casing between the casing and the O.D. of the liner. We propose to test that for thirty minutes and if there's any drop in pressure, we propose to squeeze the top of the liner.

Q You are going to circulate the cement on the 4- $\frac{1}{2}$?

A Yes, sir.

Q So that is probably potentially the weakest spot in this completion, is it not?

A Yes.

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

MR. PAYNE: Yes, sir.

BY MR. PAYNE:

Q Mr. Abbott, as I understand your testimony, the injection interval is below the completion interval in any of the adjacent wells, is that right?

A Yes, sir.

Q Is this well currently capable of producing?

A No, sir, not commercially.

Q So that conversion of it to an injection well will not leave oil in the ground that would otherwise be recovered?

A No, sir.

Q Do you propose to inject by gravity?

A Yes, sir.

Q How old is the casing in this well?



A Approximately three years old, I believe.

Q When the well was completed, new casing was used?

A Yes, sir.

MR. PAYNE: Thank you.

MR. UTZ: Mr. Porter.

BY MR. PORTER:

Q How much water do you plan to dispose of in this well?

A Some days it runs off a thousand barrels an hour disposing in the two wells we have at present.

MR. UTZ: A thousand barrels an hour?

A Yes.

Q You run above 20,000 barrels a day?

A In the two wells.

MR. UTZ: This well has been temporarily abandoned for some time, hasn't it?

A Yes, I don't know, I think it produced a total of 889 barrels of oil. I think it was abandoned shortly after completion.

Q (By Mr. Porter) It would take to pay it out?

A No.

MR. UTZ: Any other questions? If not, the witness may be excused.

(Witness excused.)

MR. UTZ: Are there any statements in this case? The case will be taken under advisement.

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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 11th day of August, 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 No. 2045 heard by me on Aug. 10, 1960.
Thomas A. [Signature] Examiner
New Mexico Oil Conservation Commission

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