STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO

26 July 1989

EXAMINER HEARING

IN THE MATTER OF:

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| Application of Phillips Petroleum Company for salt water disposal, Eddy County, New Mexico. | CASE 9708 |

BEFORE: David R. Catanach, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

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| For the Division: | Robert G. Stovall<br>Attorney at Law<br>Legal Counsel to the Division<br>State Land Office Building<br>Santa Fe, New Mexico |
| For Phillips Petroleum Company: | W. Thomas Kellahin<br>Attorney at Law<br>KELLAHIN, KELLAHIN & AUBREY<br>P. O. Box 2265<br>Santa Fe, New Mexico 87504 |

# I N D E X



## E X H I B I T S

MR. CATANACH: Call next Case Number 9708.

MR. STOVALL: Application of Phillips Petroleum Company for salt water disposal, Eddy County, New Mexico.

MR. CATANACH: Are there appearances in this case?

MR. KELLAHIN: May it please the Examiner, my name is Tom Kellahin with the Santa Fe law firm of Kellahin, Kellahin & Aubrey. I'm appearing on behalf of Phillips Petroleum Company and I have one witness.

MR. CATANACH: Will the witness please stand and be sworn in?

(Witness sworn.)

SUSAN COURTRIGHT,

being called as a witness and being duly sworn upon her oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Ms. Courright, would you please state your name and occupation?

A Yes. My name is Susan Courtright and I'm a reservoir engineer for Phillips Petroleum Company.

Q Ms. Courtright, on previous occasions have you testified as a reservoir engineer before the Oil Conservation Division?

A Yes, I have.

Q And pursuant to your employment by Phillips Petroleum Company as a reservoir engineer have you studied the facts surrounding the proposal to make the subject Cruces Well No. 3 an injector, a salt water disposal well?

A Yes. I've studied our proposed operations and I've selected the No. 3 Well.

Q And did you also prepare the Commission Form C-108 that's been submitted to the examiner?

A Yes, I did.

MR. KELLAHIN: We tender Ms. Courtright as an expert reservoir engineer.

MR. CATANACH: She is so qualified.

Q Ms. Courtright, let's take a moment and have you identify for us what is marked as Exhibit Number One, and start, first of all, by identifying for us the proposed disposal well.

A The proposed disposal well is the Cruces

Well No. 3. It's identified with the purple arrow.

Q What's the significance of the area shaded in yellow?

A The area shaded in yellow is the Phillips Petroleum Cruces Lease.

Q And the wells identified with the red dots are what type of wells?

A These are all producing wells, P&A'd wells, that are in the area of review. As you see on the bottom, they're all Lynch Yates-Seven Rivers completions.

Q What is the purpose of having the No. 3 Cruces Well converted for disposal or injection of salt water?

A By using the No. 3 Well we will be able -- or the production response would be the greatest. We would be able to see response from our No. 1, our No. 2, No. 4 and No. 6 Wells.

Q What is the source of the information that you've utilized in order to prepare Exhibit Number One?

A I used the state reports.

Q Are there other examples of similar waterfloods in the area of this project in a similar formation?

A Yes, there is, approximately 6 miles to

the north/northwest, or if you refer to Exhibit Number Two, Anadarko is conducting a waterflood in the Teas Yates.

Q And how does the Teas Yates interval compare to that being produced in the Lynch Pool?

A They're very corralatable (sic). In the Lynch Yates Pool the main pay is the Capitan Reef or what is referred to as the Seven Rivers Reef; however, the interval that we're looking at waterflooding or disposing into is -- are the three Yates Sands.

Q Let's look at a comparison of logs for the two different areas and let me direct your attention to Exhibit Number Three. What have you shown on that display?

A Exhibit Number Three is are two logs correlating the Teas Yates with the Lynch Yates. As you can see, the sands are quite correlatable (sic) and we propose to inject into the same -- the same sand.

Q What is the specific injection interval for the No. 3 Well in terms of footage?

A In our No. 3 Well we will be injecting from 3509 to 3629.

Q And that is an interval that will cover what portion of the Yates formation?

A It will cover the upper Yates, middle Yates and lower Yates.

Q What will be the source of the water put

into the disposal well?

A Initially we will be injecting only our produced water.

Q And that's water produced from the Cruces Lease?

A Yes, it is.

Q After that what is your plans for the development?

A We plan to enter one well. It is our No. 5 Well, which is P&A'd and use this as a water supply well.

Q Have you attempted to determine whether or not you should receive a favorable response in terms of additional oil recovery by utilizing the No. 3 Well as an injector well?

A Yes, I have. I've looked to the Anadarko Teas Yates waterflood, and, as shown on Exhibit Number Four, in 1972 you can see quite clearly where there have been waterflood operations and their cum recovery to date.

Q In the absence of their waterflood, the green line would show what would be primary and then forecasted production in the absence of a waterflood?

A That's correct, and they would have produced a cumulative total of 47,000 barrels of oil and with

the waterflood, I forecast that they'll be able to achieve 128,000 barrels of oil, and this is well over a 2-to-1 primary to secondary ratio.

Q Identify for us Exhibit Number Five.

A Exhibit Number Five is a cumulative plot from a typical Lynch Yates well, our Cruces Well No. 4. As with Exhibit Number Four for the Teas Yates, I have shown in green our total cumulative production to date for this No. 4 Well.

We would cum approximately 95,000 barrels of oil on primary production.

Q What assumptions are made in that forecast, Ms. Courtright, with regards to the volumes of injected water in order to get this type of response?

A What we have here is a -- is what we feel a typical well, the potential for recovery if we had a normal 5-spot and we feel that we -- this is the potential for our lease to recover if we're able to implement a full waterflood.

Q And the first well, then, proposed for this project would be the conversion of the No. 3 Well into an injector well?

A Yes, that's correct.

Q Let's go to Exhibit Number Six and have you identify and describe that exhibit.

A Exhibit Number Six is a core report from our No. 3 Well, which we do propose to be our injection well. Over in the lefthand column is the porosity and permeability. Our porosity averages anywhere from 8 to 20 percent and the permeability may be as high as 90 but it averages less than 2 millidarcies.

And what I want to show here is that this formation is acceptable, capable of accepting water.

Q When we look at Exhibit Number One, are there any other salt water disposal wells in this relative interval that have been previously approved by the Division?

A Yes, there are. There are two wells. One is the Dan Berry Salt Water Disposal Well No. 4. It is the westernmost blue arrow.

The second one is Burke Royalty Salt Water Disposal Well No. 3.

Both these wells are injecting into the Lynch Yates Seven Rivers.

Q Do you have an approximate date as to when each of those was approved for disposal purposes? Do you recall how old those are?

A I believe within the last 10 years and is certainly a piece of information I can verify for you.

Q In examining the area of review, which

is this half mile radius circle, do you find any wellbores in your opinion as a reservoir engineer that might be inadequately plugged or cemented in such a way that they would be a source by which injected fluids into the formation would migrate into shallower freshwater sands?

A No, sir. I have examined all the wells and based upon the available state reports, I've determined that all the wells are properly cemented and plugged.

Q In looking at the information available from the two previously approved disposal wells, do you see any adverse response from the injection of produced water into either of those wells?

A No, sir.

Q You don't see any adverse consequences in offsetting wells?

A No, sir.

Q No flows at the surface?

A No, sir.

Q Let's go to Exhibit Number Seven, which is the Commission Form C-108. You prepared that exhibit?

A Yes, I did.

Q Let's turn to the information just right after the form. I believe it's marked as page 2. What have you presented there on that portion of the exhibit?

A This is the well data which is requested

under Roman Numeral III on the Form C-108.

Q All right, let's turn to page 3. What is the information shown on page 3?

A Page 3 is a summary of the locations, the date spudded, the TD, the surface casing and production and casing information for all wells within the area of review.

Q Is this the source of the information by which you previously concluded for me that you find none of the wells in the half mile radius of review that would qualify as problem wells?

A Yes, sir, that's correct, and one well which I have just recently verified with the available paper work in this office, is the ARCO Fletcher A Federal No. 1. It is shown as attachment number 5. This well is P & A'd and they used 1,500 sacks of cement, which I calculate, using 50 percent excess and a cement yield of 1.3, that the cement top is only up to 1000; however, we have visually inspected this well site and all the paperwork submitted to the state does show that it was properly cemented and cement was circulated to the surface.

Q And page four is a continuation of the tabulation of similar information for the other wells in the area of review?

A Yes, that's correct.

Q All right, what's shown on page 5?

A Page 5 lists our proposed injection operation and the other date which is requested on Form C-108.

Q Do you have an opinion as to whether or not you will be able to maintain a surface injection pressure within the Division guidelines of .2 psi per foot of depth?

A Oh, yes, that's the maximum pressure that we have requested and our average pressure of 500 psi is an estimated pressure based on what the other salt water disposal wells are injecting.

Q The "other" meaning the other two in the half mile radius?

A Yes, that's correct.

Q Have you examined to determine whether or not there are any likely fresh water sands in this vicinity, and, if so, at what depth?

A Yes, sir. The fresh water source is the Ogallala and the base is at 63 feet.

Q Let's turn to page 6. What is shown on this display?

A Page 6 is the proposed wellbore schematic for the Cruces Well No. 3, our proposed injection well.

Q Is this the current status of this well?

A Yes, it is.

Q And is it still a producer right now?

A No, sir, currently, right now it is a shut-in producer.

Q And what action will you have to take in order to convert this into an injector?

A To install plastic lining, plastic coated tubing and a packer.

Q Will you have a pressure gauge or some other way to monitor the annular space on the well?

A Yes, sir.

Q All right, exhibit page 7 to this Exhibit Number Seven, what does that show?

A This is simply a larger area of review showing both the 2-mile radius and the half mile radius.

Q All right, page number 8?

A Yes. Page number 8 is the first of the P & A'd wells. It is our Cruces No. 5 Well.

Q And in reviewing information on this plugged and abandoned well, do you see any indication that it is other than properly plugged and abandoned?

A No, sir, it is, in my opinion, properly plugged.

Q Page 9?

A Is once again a P & A'd well. This is the ARCO Fletcher ADE Federal Well No. 3, and I've concluded that this well is properly plugged.

Q Okay, page 10?

A Page 10 is the P & A'd well which I spoke about earlier. I show that the cement top doesn't go to surface; however, we have visually inspected this well site.

Q You actually sent one of the Phillips personnel out to look at this wellsite?

A Yes, I did.

Q Turn to page 11. What is shown there?

A This is a fresh or produced water analysis from our Cruces Lease.

Q All right, and page 12?

A Page 12 shows the location of 3 fresh water samples which we obtained.

Q All right, page 13?

A Page 13 through page 15 are the fresh water analyses from the well samples.

Q These are all wells that are producing from the shallow Ogallala formation?

A Yes.

Q In completing your review, do you see any opportunity that the water disposed of in the injector

well will migrate out of the injection formation into any shallow fresh water sands?

A No, sir.

Q Is there any open faulting or other geologic features that would be a source of migration of those fluids?

A No.

Q Turn to Exhibit Number Eight, if you will. Would you identify that exhibit for us?

A Exhibit Number Eight shows in black the oil production from our Cruces lease; the blue is the water production and the red shows the number of wells producing on the Cruces Lease.

Q What's the purpose of this exhibit?

A What I wish to show is that currently we have four shut-in producing wells. This is due to the high salt water disposal cost that we have right now. It's approximately $1.50 per barrel. In order to improve the economic standing of this lease, we would like to use the No. 3 Well as an injection well in which we will be injecting our produced water, thereby alleviating our high salt water disposal cost and we also, or we anticipate waterflood operations in which we'll be able to produce in excess of 150,000 barrels of oil.

Q Let me show you what is marked as

Exhibit Number Nine, which is a certificate of mailing. Attached to that is a tabulation of various interest owners. Did you cause to be prepared a tabulation of the various interest owners within the half mile radius that were entitled to notification of this case?

A Yes, sir, I provided you with these names and addresses.

Q To the best of your knowledge is that list complete and accurate?

A Yes, it is.

Q Can you identify for us which of those individuals is the owner of the surface at the Cruces No. 3 injector well location?

A This would be Daniel C. Berry and also Ronald Phillip Berry.

Q Have you received any objection from the Berrys or from anyone notified as to your proposed application?

A No.

MR. KELLAHIN: Mr. Examiner, at this time we move the introduction of Phillips' Exhibits One through Nine. The original notification is submitted to you as Exhibit Number Nine.

MR. CATANACH: Exhibits One through Nine will be admitted into evidence.

CROSS EXAMINATION

BY MR. CATANACH:

Q Ms. Courtright, on the -- on your -- on your page 4 on Exhibit Number -- on the C-108, you show a well that was drilled in 1959, the Hanson B No. 3, that apparently you couldn't find any information on the -- on the plugging or the --

A All we were able to find were their proposed operations. We do have a copy of that if you would like to look at that.

We also do have the notification that this well was plugged and the approval by the State.

Q Do you have any plugging information on it?

A Yes, sir, we do.

MR. KELLAHIN: I'm sorry, Mr. Examiner, which well are we examining?

MR. CATANACH: The Hanson B No. 3, (unclear).

MR. KELLAHIN: We subsequently found some of that information here in Santa Fe, Mr. Examiner, and Ms. Courtright has that and we'll submit it to you after we complete the presentation.

Q Great.

A But we don't have any of the plugging information; however, that's all the information which is available in the State file.

Q And you couldn't find any information at the Hobbs office?

A No, that's the same information that was available.

Q Oh, this is?

A Yeah.

MR. KELLAHIN: Mr. Examiner, the Hanson B No. 3 Well is beyond the half mile radius circle.

Q Oh, it is?

A Yes, it is.

MR. KELLAHIN: Which may satisfy some of your concern.

MR. CATANACH: Why is it listed here?

MR. KELLAHIN: Well, because it was close yet not within it, and we simply were trying to tabulate the information but it's not available in Hobbs, but it may be beyond the point of your concern.

MR. CATANACH: I see.

Q And initially what volumes are you to be putting in the well?

A Initially, once we reactivate our producers, we anticipate injecting 50 barrels of produced water.

Q Reactivating producers, are they currently shut in?

A Yes, sir, they are shut in to alleviate our high disposal costs.

Q Okay.

MR. CATANACH: I believe that's all I have of the witness. She may be excused.

Off the record, Sally, for a minute.

(Thereupon a discussion was had off the record.)

MR. CATANACH: Okay, back on the record.

MR. KELLAHIN: Mr. Examiner, I understand that the case has not been properly advertised in the appropriate newspaper to show it's Lea County property and that the case will be left open for the Examiner docket on August 23rd.

In readvertising the case we would request that the Division readvertise this as a waterflood project area as opposed to a salt water disposal

well and that the subsequent order issued with regards to this application identify this as a waterflood project.

MR. CATANACH: Okay, Mr. Kellahin, we'll make the necessary changes in the advertisement.

And we'll leave the record open in this case or continue the case until August 23rd.

(Hearing concluded.)

C E R T I F I C A T E

I, SALLY W. BOYD, C. S. R. DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division (Commission) was reported by me; that the said transcript is a full, true and correct record of the hearing, prepared by me to the best of my ability.

Sally W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 9708, heard by me on July 26 1989.

David R. Catanach, Examiner
Oil Conservation Division

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO

23 August 1989

EXAMINER HEARING

IN THE MATTER OF:

Application of Phillips Petroleum Company for a waterflood project, Lea County, New Mexico. CASE 9708

BEFORE: David R. Catanach, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Division:

For the Applicant:

MR. CATANACH: Call next Case No. 9734, application of Phillips Petroleum Company for a waterflood project, Lea County, New Mexico.

This case was originally heard July -- has been previously heard and had to be readvertised in a Lea County newspaper, I understand.

Is there any additional evidence or testimony at the present time?

If not, this case will be taken under advisement.

(Hearing concluded.)

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