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

13 March 1985

EXAMINER HEARING

IN THE MATTER OF:

The application of Phillips Petroleum Company for salt water disposal, Eddy County, New Mexico.	CASE 8526

BEFORE: Gilbert P. Quintana, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation Division:	Jeff Taylor Attorney at Law Legal Counsel to the Division State Land Office Bldg. Santa Fe, New Mexico 87501
For the Applicant:	W. Thomas Kellahin Attorney at Law KELLAHIN & KELLAHIN P. O. Box 2265 Santa Fe, New Mexico 87501

I N D E X

JOHN UPCHURCH

E X H I B I T S

MR. QUINTANA: We'll call Case 8526.

MR. TAYLOR: The application of Phillips Petroleum Company for salt water disposal, Eddy County, New Mexico.

MR. KELLAHIN: If the Examiner please, I'm Tom Kellahin of Santa Fe, New Mexico, appearing on behalf of the applicant.

And I have one witness to be sworn.

MR. QUINTANA: Are there other appearances in Case 8526?

If not, sir, would you please stand up and be sworn in at this time?

(Witness sworn.)

JOHN UPCHURCH,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Upchurch, for the record would you please state your name and occupation?

A My name is John Upchurch and I'm a petroleum engineer for Phillips Oil Company in Odessa, Texas.

Q Mr. Upchurch, have you previously testified before the Oil Conservation Division and had your qualifications as an engineer accepted and made a matter of record?

A Yes, I have.

Q And pursuant to your employment by Phillips Petroleum Company have you made a study of the facts surrounding this application?

A Yes, I have.

MR. KELLAHIN: Mr. Quintana, we tender Mr. Upchurch as an expert petroleum engineer.

MR. QUINTANA: He's considered qualified.

You may proceed.

Q Mr. Upchurch, if you will turn to what we have marked as Exhibit Number One, which is the Commission Form C-108 and all the attachments, and have you turn, sir, first of all, to the plat that shows the half mile radius circle and the two-mile radius circle.

Would you explain to Mr. Quintana the purpose for this disposal well? How did it come about?

A This well is a well that Phillips plans to drill as a result of the Oil Conservation Division ordering us to shut down the current water disposal pit at the Phillips Petroleum Company Artesia Plant.

The Commission has informed us that our disposal of the waste water from the plant in an open pit is

not an acceptable means of disposal and we would have to dispose of it in some other manner.

We looked at several alternatives and decided that drilling a disposal well on the plant site would be the most economical alternative.

Q What type of plant is this, Mr. Upchurch?

A It's a natural gas liquids plant, removes the liquids from produced gas.

Q And prior to this time what was being done with the water produced and discharged from the plant?

A It was pumped into an open pit and allowed to evaporate.

Q And the water analysis from that water has exceeded certain State standards with regards to what elements, Mr. Upchurch?

A The water analysis from the plant waste water is attached and it's exceeded the State standards for five -- four elements and the total dissolved solids; the four elements or compounds are chromium, chloride, floride, and phenols.

MR. QUINTANA: Excuse me just a second. I think another member of the OCD would like to sit in on this and I forgot to inform him.

Q Mr. Upchurch, would you again describe for us what brought about the need for Phillips Petroleum Company to drill a salt water disposal well that's the subject of this application?

A Phillips was informed by the NMOCD that the current method of disposal of the plant waste water in an open pit was unacceptable and that we needed to find an alternative method of disposal.

We investigated several different options and decided that the drilling of a disposal well on the plant site would be the cheapest alternative.

Q What will the location of the disposal well be?

A The well will be located 2310 feet from the east line and 13 -- and 330 feet from the south line in Section 7, Township 18 South, R 29 East.

I might want to point out that on the second sheet of the application, that the footage location is in error. It's the -- the proper location is on this wellbore sketch and a proper -- yes, that's the proper location, and the proper location was also advertised in the Artesia paper.

Q All right. Let's turn to the wellbore schematic of the proposed disposal well and at the same time look at the well data sheet for the proposed well, Mr. Upchurch.

In determining a suitable disposal formation, can you identify for us and describe what in your opinion will be a suitable disposal formation?

A Based on the other wells in the area, we feel that we'll be able to dispose of the volume of water

that we're talking about only into the Lower San Andres and possibly Upper Glorieta formation; the Lower San Andres at approximately 3370 feet to 3975 feet underneath the plant. The Glorieta formation is below that, approximately 4000 feet on down.

We feel that there's adequate porosity in that area of the San Andres to dispose of the water that we're -- that we need to get rid of.

Q When we look at the wellbore schematic, you've indicated for us that there were certain elements in the discharged water that exceeded the State standard.

Are there any hydrocarbons contained in the discharged water?

A No, there are not.

Q In your opinion is the method of completion for the disposal well, using the plastic-lined tubing, one that is engineered in a sound way to protect the integrity of the wellbore in terms of the volumes of discharged water and the elements contained in that water?

A Yes, I feel that it is.

Q This is a well to be newly drilled and is not a conversion of an existing well.

A That's correct.

Q Will you fill the annular space between the casing and the tubing with an inert fluid?

A Yes, we will.

Q And will there be a pressure gauge on the

surface?

A Yes, there will.

Q The pressure limitation guideline used by the Commission of 0.2 psi per foot of depth, is that a guideline that you can stay within?

A Based on what we know so far, we feel that we should be able to inject at or below the 0.2 psi per foot limitation. If, once we get the well drilled and completed, we find that that's not the case, we would like to have included in this order a provision to administratively increase that injection pressure based on the completion of a step rate test.

Q All right, you're talking about using the standard order language that requires you to coordinate with the OCD District Office and conduct step rate tests for the monitoring of pressures in excess of the standard?

A Yes, that's correct.

Q Let's turn to the area map, Mr. Upchurch, and while looking at that map if you'll take the two page tabulation of the offsetting wells within the half mile radius, first of all, within the area of review, Mr. Upchurch, have you found any wells that produce below the proposed disposal interval?

A Within the half mile area of review there are no wells that produce from the zone that we want to inject into or from any deeper zones, and on our original application we so stated that and felt that there was no need

to include the offset wells, since none of them produce from that zone.

The Commission decided that we should set the case rather than administratively approving this application; the case should be set for hearing and suggested to me that we include a listing of the offset wells, and that's what I prepared.

Q All right, this two page attachment, then, shows all the wells within the half mile radius --

A Yes, that's correct.

Q -- regardless of the depth.

A That's correct.

Q All right. Let's stop for a moment now, Mr. Upchurch, and direct your attention to the cross section you've prepared, which is marked as Exhibit Number Two.

Before you explain the exhibit, sir, would you simply identify for us -- the exhibit for us and locate the wells that are on the cross section?

A Okay. This exhibit shows the porosity logs from three wells in the area of the -- of our injection.

The first well is the Phillips Petroleum Company Ilinois Camp "A" No. 1.

The second -- and it's in Unit letter E of Section 5.

The second well is an Aminoil drilled well that was -- has been recompleted in the Grayburg. It's

in Unit letter J of Section 8.

And the last well is a shallow well that was drilled in Unit letter I of Section 18.

Q Will you take one of the logs for one of the wells and identify for the Examiner what the location is for the disposal interval?

A Okay. The easiest one to see it on is the Illinois Camp "A", the furthest to the left well, and we're -- the zone that we're interested in is the zone that appears in this well from approximately 3200 to 3550. There's two large porosity zones which show a maximum of 22 and 24 percent porosity based on this neutron log.

That same zone correlates to approximately 3500 to 3850 in the Aminoil well and it's not present in the third well, because that well was not drilled deep enough.

Q When we look at the tabulation of wellbore information for the wells within the area of review, would you identify for us generally that section or interval that was tested or produces in these wells in relation to the disposal interval?

A The presently producing wells in the area of review produce from the Grayburg formation, which lies on top of the San Andres. In the Illinois Camp Well that would be at approximately 21 -- the base of that would be at approximately 2100 feet, and at approximately 2350 in the Aminoil well and at approximately 3000 feet -- excuse me --

2000 feet, more or less, in the third well.

Q All right, sir, let me direct your attention now before you leave the cross section to the schematics of the four plugged and abandoned wells that are within the area of review.

All right, the first one I have on my list is the Simpson Federal No. 1.

A Yes.

Q If you'll turn to the Simpson Federal No. 1. In your opinion is the Simpson Federal No. 1 Well a well that has been adequately plugged and abandoned?

A Yes, I feel that it is adequately plugged.

Q All right, let's turn to the Texaco State No. 1 schematic.

In your opinion is this wellbore adequately plugged and abandoned?

A This wellbore doesn't meet current State standards. If we were plugging today we wouldn't do it exactly this way, or whoever owned it wouldn't do it this way, but I feel that it is adequately plugged to prevent migration of fluids that we'll be injecting into the Lower San Andres into any fresh water strata or into any other strata in the area.

Q Let's look at the wellbore for the Texas State No. 1 in terms of the disposal interval. Can you tell me the approximatel difference between the interval in the

Texaco well and the disposal interval in your well?

A The Texaco State No. 1 Well is drilled to a depth of 2265, which is approximately 1000 or 1100 feet above the zone that we want to inject into.

Q So even if this wellbore is not plugged and abandoned consistent with current standards, it's still some 1000 feet above the proposed disposal interval?

A Yes, that is correct.

Q All right. Let's go to the Simpson No. 2, Mr. Upchurch.

In your opinion is this wellbore adequately plugged and abandoned?

A Yes, I feel that this well is plugged in sufficient manner to protect from fluids migrating from the Lower San Andres into the fresh water or any other strata in the area.

Q And again this wellbore is only 1795 feet deep.

A Yes, that's correct. It's over 15-1600 feet away from our injection interval.

Q Okay, and then the last wellbore is plugged and abandoned well State "E" No. 1.

In your opinion is this wellbore adequately plugged and abandoned?

A Yes, I feel that it is. There are plugs -- there -- there are sufficient plugs in here to prevent migration of fluids into the fresh water strata.

The well is drilled to a total depth of 3020 feet, which is, if you bring it on depth with where our injection well is going to be, it would TD at approximately 2950, which again is over 400 feet away from our injection interval.

Q All right, there is some 400 feet vertical separation between the two intervals?

A Yes, that's correct.

Q I might also point out on the cross section, it's very obvious on the Aminoil Well and on the Illirois Camp Well, approximately 100 feet above the zone that we wish to inject into is a zone that basically has a zero percent porosity, which would prevent fluids from migrating from the injection zone up in the San Andres formation.

Q All right, let me direct your attention now to the water analyses that were conducted for this application, and I believe there are four.

A Yes, that's correct.

Q All right, sir, if you'll set all four of those out in front of you, let's talk about them.

First of all, if you'll identify each of the four and tell us what we're looking at.

A Okay. Well, actually there's five. There's -- the first one, there's two on this one sheet with the compatibility test. There are two actual samples on there.

The first one is the analysis of the

waste water from the plant.

The second one, second and third ones are a compatibility test done by UniChem International in Hobbs, comparing plant -- a sample that's 90 percent plant produced, plant water, with San Andres produced water, and showing a sample of San Andres water with no plant water, and then there's two additional samples taken from fresh water wells within approximately a half to a quarter mile of the proposed injection well.

Q All right, let's turn your attention first of all to the fresh water analysis.

Can you generally identify for us the location of these fresh water sources?

A Yes, the first one, labeled Artesia West Windmill, is approximately one-quarte mile north northwest of the proposed injection well, and the second one, labeled Artesia Upgrade Windmill, East Windmill, is approximately one-half mile east northeast of the proposed injection well.

Q Do you know what the approximate depth is of the fresh water produced in the Artesia West Windmill?

A The depth in both wells, total depth of the wells are approximately 250 feet. They produce from the Ogallala, as far as the exact depth, I'm not sure.

Q All right. You're going to set surface casing and cement back up to the surface a vertical distance in excess of plus or minus 350 feet?

A Yes, that's correct.

Q And that, in your opinion, would be adequate to isolate any fresh water sands in the area?

A Yes, that's correct.

Q All right. Let's go back, then, to the analysis of the compatibility test between the San Andres and the plant water. It was from this exhibit that you identified certain elements or components that exceeded the State standard?

A No. The analysis that we used for the -- to determine which elements exceeded the State standard is the plant waste water sample. It's a more detailed analysis than the compatibility test.

Q All right. In your opinion, Mr. Upchurch, is the proposed use of this disposal well the most effective and efficient means by which to dispose of this produced water?

A Yes, I feel that it is.

Q Let me direct your attention now to the notice provisions in the C-108 Form, and have you identify whether or not you have notified the surface owner at the location?

A The surface owner at the location is Phillips Petroleum Company.

Q Have you also notified by certified mail any of the offset operators within the half mile radius?

A Yes, we have. There's a listing of the offset operators attached to the C-108, along with a copy of

the certified mail that we sent out to each of those operators.

We sent this entire package to all of them.

Q Based upon your studies and investigations, Mr. Upchurch, do you find any faulting or other hydrologic connections by which water disposed of in this formation could potentially migrate up into shallower fresh water sands?

A No, I don't find any faulting at all -- at all in the area.

Q In your opinion will the water disposed of in the Lower San Andres and Glorieta interval requested remain confined in that formation?

A Yes, I feel that it will.

Q Would you identify for the Examiner the approximate rates at which you will dispose of water into this well?

A We plan to dispose of the waste water from the plant at approximately 1200 to 1500 barrels a day with a maximum rate of 2000 barrels a day. The rate varies depending on the plant requirements.

Q Was the C-108 prepared under your direction and supervision and Exhibit Number Two, the cross section also prepared under your direction?

A Yes, they were.

MR. KELLAHIN: That concludes

our examination of Mr. Upchurch, Mr. Quintana.

We move the introduction of Exhibits One and Two.

MR. QUINTANA: Exhibits One and Two, did you say?

MR. KELLAHIN: Yes, sir.

MR. QUINTANA: One and Two will be entered as evidence.

Mr. Boyer, do you have questions of Mr. Upchurch?

MR. BOYER: I just have one question.

QUESTIONS BY MR. UPCHURCH:

Q The compatibility sample that is shown, when was that taken and where was the location? Do you have information on that?

A I'm not positive of the date. It was prior to when we made our original application, approximately November, December. The produced water sample was taken from the Burch A Lease, which is in Section 18 of Township 17 South, Range 29 East. We felt that that was the best sample to use because, first of all, we didn't have any San Andres production. Nobody has any San Andres production in the area, and we don't have any production at all.

We thought that it was better to take a San Andres sample rather than a Grayburg sample.

Q Well, my concern was the difference between the total dissolved solids of the Artesia Plant water given in that analysis and the earlier analysis that was done in 1983.

A Well, the total dissolved solids on this compatibility test are comparing 10 percent San Andres produced water and 90 percent plant water, so I think that the total dissolved solids that you see in there are coming from the San Andres, not from the plant water.

Q Okay.

MR. BOYER: That's all.

CROSS EXAMINATION

BY MR. TAYLOR:

Q What letter did you send --

A Okay, we --

Q -- to the other surface owners with the notice?

A I didn't include that in the packet. It was --

Q Was it just a cover letter?

A It was just a cover letter saying --

Q Could you make a copy of it for our file?

A Yes.

It was the same letter that's submitted with the original application.

Q Okay, it just went out to everybody.

A That's right. Carbon copies went to all the offset operators.

MR. QUINTANA: I have one question for you, Mr. Upchurch.

A All right.

CROSS EXAMINATION

BY MR. QUINTANA:

Q Produced water coming from this plant, what is the source of that water?

A It's fresh water that's piped into the plant and it comes from the Loco Hills area. It comes from the Ogallala. Exactly where it comes from, I don't know. We purchase it.

Q What is the purpose of the water at the plant?

A It's used for cooling purposes. It's run through the plant cooling towers, which is where it picks up the contaminants, and we use it to cool the gas down in the -- in the processing procedure.

One of the things we have to do to the gas in order to process liquids out of it is compress it, and when we compress it, it builds up a lot of heat, which then has to be dissipated, so we run it through a liquid, gas/liquid heat exchanger and take the heat off with the -- with the water.

Q All right, is there any produced water

from dehydration of the gas?

A No.

Q Thank you, sir.

MR. QUINTANA: Any further questions of the witness?

If not, the witness may be excused.

Case 8526 will be taken under advisement.

(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 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 ...

MARCH 13 8526 85

Gilbert P. Quintana, Examiner

Oil Conservation Division