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

5 September 1984

EXAMINER HEARING

IN THE MATTER OF:

Application of Sun Exploration and Production Company for amendment to Division Order R-7313-A, Lea County, New Mexico.	CASE 8333

BEFORE: Gilbert P. Quintana, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation Division:	Charles E. Roybal Attorney at Law Energy and Minerals Dept. 525 Camino de Los Marquez 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

E X H I B I T S

MR. QUINTANA: We'll call next Case 8333.

MR. ROYBAL: Case 8333. Application of Sun Exploration and Production Company for amendment of Division Order R-7313-A, Lea 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: Will you stand and be sworn in?

(Witness sworn.)

ROBERT W. WALKER,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Walker, would you please state your name and occupation?

A My name is Robert W. Walker. I'm a geologist with Sun Exploration and Production Company in Midland, Texas. From it.

Q Mr. Walker, would you describe for the

Examiner when and where you obtained your degree in geology?

A Yes, sir. I graduated from Texas Tech University in Lubbock, Texas, December, 1976.

I mud logged for about two and a half years out in southeastern New Mexico and West Texas after graduation and have currently been employed by Sun Exploration and Production Company for the last -- little over five years.

Q Mr. Walker, have you made a review of the geology surrounding this application by Sun Exploration and Production Company as well as review and satisfy yourself of the accuracy of the information that has been included on Commission Form C-108?

A Yes, sir, I have.

MR. KELLAHIN: We tender Mr. Walker as an expert petroleum geologist.

MR. QUINTANA: He's considered an expert petroleum geologist.

Q Mr. Walker, let me direct your attention to what we have marked as Exhibit Number One, first of all, and have you simply identify the exhibit for me and then we'll go into some detail about what the exhibit contains.

A All right, sir. We are attempting to deepen the Jennings "B" Federal No. 2, which is located in the south -- in the southeast quarter of the southwest quarter of Section 15, Township 19 South, Range 32 East of Lea County, New Mexico, and that is the well on the extreme left

of the cross section, and I put in a north offset, which would be the Jennings Federal "B" No. 1, which would be located in the northeast quarter of the southwest quarter of Section 15. It's a 40-acre offset to the "B" No. 2, located in Unit letter K.

Now, the Jennings Federal "B" No. 1 did penetrate the Seven Rivers formation, which we are attempting to deepen into here.

You can see the top of the Seven Rivers is approximately 3100 feet and -- which you go into a porous, secrosic dolomite beneath your Yates sand, and we propose to deepen to a depth of 3350, which shows correlative on our well, the "B" 1, over to the "B" 2 which we're attempting to deepen into.

Q All right. The well on the far left of the cross section is the disposal well.

A Yes, sir, that is correct.

Q This well was previously approved as a disposal well in the Yates formation, was it not?

A Yes, that is correct.

Q Would you give the examiner that order? I think it's in the package of C-108, Mr. Examiner, if you'll simply turn the page, you'll see a copy of the order.

All right, this is the same well that was approved in October, '83 for disposal into the Yates formation?

A That is correct.

Q All right. What happened when you attempted to dispose of water in the Yates formation in this well?

A All right, sir. In October we -- it was approved to dispose into the Yates from approximately 2986 to 3060, selectively, in some sands within that vertical interval.

The -- our maximum pressure was around 600 pounds, I believe, and when we hooked this well up to injection our pressure increased within just a very short time to approximately 1250 psi and still increasing, and like I previously mentioned, our limitation was 600 psi.

So we went in --

Q The well was too tight.

A Yes, sir, it was.

Q All right.

A The well was then acidized with 1000 gallons of 15 percent NEHCL and even it took our acid at an average pressure of 1750 pounds and our injection pressure was still too high, and so the well has been shut in since March of '84.

Q It appears as if the Yates formation is not an adequate zone to take the water which you want to dispose of.

A That is correct. We don't feel -- it does not have the permeability within those sands.

Q All right, and the proposal, then, is to

deepen the same well and to test the possibility of disposing of this water into the Seven Rivers formation.

A Yes, sir, that is correct.

Q And when we look at the cross section and come around -- come across to the other well, the closest -- looking at the Seven Rivers formation in that well, what do you find happens in the Seven Rivers formation?

A Well, we see it is an extremely clean formation, looking at the gamma ray. The porosity is extremely high. We -- we did test this well when we drilled it. Let me get the data on that. We tested this well down in the Seven Rivers from approximately 3331 to 3337. We acidized the well and our initial shut-in pressure did go on vacuum and that tells us that we -- we feel like we do have some permeability within these Seven Rivers dolomites.

Q In seven hours you swabbed 118 barrels of water and no oil.

A That is correct, yes, sir. It is non-productive.

Q All right. Of any of the wells that you've examined in this area, is the Seven Rivers productive of oil?

A No, sir, it is not.

Q All right, where is the closest producing Seven Rivers well? Is it on any of these exhibits?

A Well, no, sir, it isn't. Well, it's not on any of the exhibits. We have -- we have found some Seven

Rivers production a little over two miles to the north and approximately, well, a little over two miles to the west, due west of us.

Q All right. Are there wells in the immediate area that have been drilled a depth sufficient enough to have tested the Seven Rivers formation?

A This "B" 1, which is on the exhibit.

Q All right, and drilling through that formation and testing it, it produces water.

A That is correct.

Q All right. Let's go to the C-108, now, Mr. Walker, and if you'll turn to the plat, sir, that's appended to that package of exhibits, have you reviewed the well files on plugged and abandoned and producing wells within that half mile radius?

A Yes, sir, I have.

Q Have there been any changes in the number of wells or in the producing intervals for any of those wells since the hearing on September 28th, 1983 for the prior approval of the Yates formation in this case?

A Yes, sir. You mean changes in those wells within the half mile radius?

Q Yes, sir.

A Okay. We have recently gone in, since May of '84, and plugged one, two, we've plugged three wells.

Q All right.

A In Section 22, the -- in the northeast

quarter of Section 22 would be our Sloan No. 2. We plugged and abandoned that in May of '84, and it was a 10,954-foot Wolfcamp test.

Q And what is the next well that was plugged?

A All right, sir, we came over and plugged the Sloan No. 1 in July of '84. It was a 10,915-foot Wolfcamp test, and it has been recently plugged.

Q And what's the third well that's been plugged?

A It would be the Shearn No. 1, located in the northwest -- it would be in the northwest of the southwest and it is a 14,330-foot Morrow test, and it was plugged August of '84.

Q Let's look at the Wolfcamp well to the north and east of the disposal well, still in the half mile radius. Is that a producing Wolfcamp well?

A Yes, sir, it is. We drilled that well about, let me see, I want to say about a year ago, okay, that well was drilled in 1982 and completed in '82 as a Wolfcamp producer at approximately 10,800 feet.

Q With regards to the producing and plugged and abandoned wells within the half mile radius, have you attached to the C-108 either a schematic or a tabulation of the wellbore information for each of those wells?

A Yes, sir, we have.

Q Looking at the plugged and abandoned

wells, have all those plugged and abandoned wells been properly plugged and witnessed by the Oil Conservation Division's District Supervisor?

A Yes, sir, they have.

Q And have they all been plugged and abandoned pursuant to Oil Commission rules?

A Yes, sir.

Q In your opinion are each of those plugged and abandoned wells properly plugged and abandoned to isolate the Seven Rivers?

A Yes, sir, they would be isolating both the Yates and the Seven Rivers. The most -- these upper plugs were put approximately at the top of the Tansill formation, which would isolate all your salts and evaporites above that, and the lower plugs were set where your intermediate casing was set in the original drilling of the well, and they -- they set their plugs in that overlap there.

Q All right. With regards to the producing wells within the half mile radius that produce from formations below the Yates and Seven Rivers, how many of those wells do we have?

A Just one, which would be the Jennings Federal "A" No. 4 from the Wolfcamp.

Q So the only producing well that we have that penetrates the Yates and the Seven Rivers is the Wolfcamp well. Direct us in the package of exhibits to the information addressed to that Wolfcamp well.

It's the Sloan Federal No. 2, isn't it?

A No, sir, are you talking about the Jennings "A" 4, now?

Q The "A" 4.

A Yes, uh-huh.

Q That's the one I want.

A Yes, sir, now what was your question?

Q Show us where it is in the package, you got it?

A Well, it comes --

Q You got it? Everybody's got it.

All right. My question for you, Mr. Walker, is whether or not the cement that's on the outside of the casing in that well --

A Yes, sir.

Q -- has been circulated to a point high enough that we'll have cement across the Yates and Seven Rivers formations.

A Okay. When we drilled that well we -- we set an intermediate stage of 8-5/8ths at 4400 feet and we cemented that with two stages. 2500 sacks were cemented on the first stage, which our engineering group calculated an estimated top of cement at around 2500 feet, which would get it well up into the salts.

Q All right. In making your study in this area, Mr. Walker, do you find any fresh water sands or fresh water aquifers in the immediate area, within a mile?

A No, sir, not anything other than the Ogallala formation.

Q Where is the Ogallala formation in this area in terms of its depth?

A Normally we find the Ogallala within the top 200 feet from the surface.

Q Is the method of casing and cementing for the disposal well sufficient to isolate the disposal interval from the Ogallala formation?

A Yes, sir, it is.

Q Have you made a study to determine where the fresh water wells are that produce from the Ogallala in this area?

A No, sir, I'm not familiar with the ones that are immediately in this vicinity.

Q All right, sir. Would you turn to the tabulation of information on this C-108 that talks about the specific disposal program in terms of the average and maximum daily rates of disposal?

A Yes, sir.

Q What is going to be the source of the water that will be disposed of in this well?

A Okay, we are presently producing approximately 250 barrels of water a day from our Yates wells. We have three producing Yates wells in this field and they are producing approximately 250 barrels of water and the Jennings Federal Com No. 1, which is located in -- it would be

in the southeast quarter of the northwest quarter, it's a Bone Springs well immediately outside this half mile radius, and it is presently making 58 barrels of oil and 4 barrels of water. Our water production is very small from this well and the Jennings "A" 4, our other deep well in the field.

So most of our water, we feel, is coming from the Yates here.

Q Would you identify for us, then, each of the Yates producing wells that will contribute water to be disposed of in the disposal well?

A Yes, sir. Okay, if you will go to the northwest quarter of the northwest quarter, Unit letter D, you will find our Shearn No. 3, which is presently -- wait a minute.

Let me think, the Shearn No. 3 is currently producing 29 barrels of oil and 138 barrels of water.

The -- if you'll go to the southeast quarter of the northwest quarter you'll find our Jennings Federal "C" No. 3. It is a Yates producer, producing 8 barrels of oil and 7 barrels of water.

And our only other Yates producer in the field is in the northeast quarter of the southwest quarter, Unit letter K, which is our Jennings Federal "B" No. 1, which is producing 7 barrels of oil and 107 barrels of water.

Q What do you anticipate to be the average and maximum daily rates of disposal in the well?

A Approixmately 250 barrels a day; however, we are dealing with a waterdrive reservoir. Some of these wells were potentialed initially making no water and we have seen water produced -- we've seen our water production increase the longer we produce these wells, so we feel like we need to be sure that we have enough maximum rate here, say up to 1000 barrels a day for the longevity of the lease.

Q Are you familiar with the Division's guidelines on the surface limitation pressure for a disposal well?

A Yes, sir, using their .2 psi per foot, I believe it is still approximately 600 pounds.

Q And is it acceptable to you as a geologist to have a surface limitation pressure tied into that number for this well?

A Yes, sir. Now, if we go in and find -- if we deepen the "B" No. 2 and find that this pressure is not adequate, then our engineering group will run bottom hole pressure bombs and do their step rate test to come back at a later date to make -- get an increase in pressure.

Q All right. Your package of exhibits includes water analyses of the produced water on each of these three wells that will contribute water for disposal purposes?

A Yes, sir, and our engineering group has determined it is compatible.

Q Okay. Mr. Walker, have you made a study

of available geology to determine whether or not there are any open faults or hydrologic connections between the disposal zone and any fresh water aquifers?

A We do not know of any at all, no, sir.

Q All right, sir, and have you provided notice to any offsetting operators and to the surface owner at the disposal well location?

A Yes, sir, we have, and the surface owner is the Bureau of Land Management and they have been notified.

Q All right, sir.

MR. KELLAHIN: Mr. Examiner, that concludes my examination of this witness.

We move the introduction of Exhibit One, which is the cross section and Exhibit Two will be the C-108 and its attachments.

MR. QUINTANA: Exhibits One and Two will so be admitted into evidence.

I have a question.

CROSS EXAMINATION

BY MR. QUINTANA:

Q You said you had -- you weren't aware of any fresh water wells producing within a mile of your disposal area?

A No, sir, I sure am not.

Q Could you study that and find out if

there's any and provide me with any water analyses of those fresh water wells?

A I sure will and submit it directly to you at a later date? You bet.

MR. KELLAHIN: Mr. Examiner, if you prefer, that information is contained in Case 7964, which is the case that resulted in the prior order. I have called the State Engineer's office and there are no changes to the information that has been presented in the prior case.

MR. QUINTANA: I will take note of that.

MR. KELLAHIN: All right, sir.

MR. QUINTANA: The witness may be excused.

Before you're excused, I'm sorry, there is one other question I wanted to ask.

A Yes.

Q Seeing that the Yates had difficulty in accepting water, and you propose to expand to the Seven Rivers, do you feel that it's -- do you feel that it would be appropriate that you continue to try to inject into the Yates even though you're going to continue and try to inject into the Seven Rivers, also, or would you rather -- why don't you just shut off this Yates and inject into the Seven Rivers?

A Okay. I tend to think that you will --

it will probably take some water. Of course we will be open-holing this well in the basal Yates prior to penetrating the Seven Rivers. There's a small interval in the basal part of the Yates and as far as getting any secondary recovery from water going into the Yates here, we'd probably see very little water going into the Yates formation and it would probably take the path of least resistance, which we feel in this case is the Seven Rivers.

I don't -- the well has just been -- is equipped to dispose of it in this manner, you know, into the Yates now, and we really haven't done any consideration of squeezing off those perforations prior to this deepening.

Q So it's your impression that even though the Seven Rivers will take most of the water, if the Yates can take some water you'd prefer it also to take some water.

A Yes, sir, because this is a down-dip well and our other wells are up structure to it, and we feel like if it did take some water, it could possibly enhance the pressures.

Q That will be all. Thank you.

MR. QUINTANA: You may be excused.

Case 8333 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 certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 8333, heard by me on SEPTEMBER 5 1984.

Gilbert P. Quintana, Examiner
Oil Conservation Division