STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

APPLICATION OF ROBERT N. ENFIELD FOR SALT WATER DISPOSAL, LEA COUNTY, NEW MEXICO

CASE NO. 11,485

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: MICHAEL E. STOGNER, Hearing Examiner

March 7th, 1996

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, MICHAEL E. STOGNER, Hearing Examiner, on Thursday, March 7th, 1996, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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I N D E X

March 7th, 1996
Examiner Hearing
CASE NO. 11,485

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E X H I B I T S

Applicant's	Identified	Admitted
Exhibit 1	7	13
Exhibit 2	12	13

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Harvey E. Yates	Identified	Admitted
Exhibit 1	29	36
Exhibit 2	33	36
Exhibit 3	35	36
Exhibit 4	48	55
Exhibit 5	53	55
Exhibit 6	51	55
Exhibit 7	51	55

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A P P E A R A N C E S

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By: W. THOMAS KELLAHIN

* * *

WHEREUPON, the following proceedings were had at 10:00 a.m.:

EXAMINER STOGNER: Call next case, Number 11,485.

MR. CARROLL: Application of Robert N. Enfield for salt water disposal, Lea County, New Mexico.

EXAMINER STOGNER: Call for appearances.

MR. BRUCE: Mr. Examiner, Jim Bruce from the Hinkle law firm in Santa Fe, representing the Applicant. I have one witness to be sworn.

EXAMINER STOGNER: Any other appearances?

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin and Kellahin, appearing on behalf of Harvey E. Yates Company, and I have two witnesses to be sworn.

EXAMINER STOGNER: Any other appearances?

Will the three witnesses please stand to be sworn at this time?

(Thereupon, the witnesses were sworn.)

EXAMINER STOGNER: Is there any need for opening statements, or shall we just jump into it?

MR. BRUCE: Let's just jump into it. We're asking for a disposal well, and I think the offset, Heyco, is claiming we're injecting into their producing formation.

EXAMINER STOGNER: Is that right, Mr. Kellahin?

MR. KELLAHIN: That's it, Mr. Examiner.

EXAMINER STOGNER: Okay. You may continue, Mr. Bruce.

THANE AKINS,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Would you please state your name and city of residence for the record?

A. Thane Akins, from Midland, Texas.

Q. By whom are you employed?

A. By Robert Enfield.

Q. And in what capacity?

A. As a consulting petroleum engineer.

Q. Have you previously testified before the Division as a petroleum engineer?

A. Yes.

Q. And were your credentials as an expert petroleum engineer accepted as a matter of record?

A. Yes.

Q. And are you familiar with the engineering matters related to the subject Application?

A. Yes, I am.

MR. BRUCE: Mr. Examiner, I would tender Mr. Akins as an expert petroleum engineer.

EXAMINER STOGNER: Any objection?

MR. KELLAHIN: No objection.

EXAMINER STOGNER: Mr. Akins is so qualified.

Q. (By Mr. Bruce) Briefly, Mr. Akins, what does Mr. Enfield seek in this Application?

A. We are applying to inject produced water into the Penrose sand, which is a lower member of the Queen formation, and we are applying for injecting into the Hudson 31 Federal Well Number 1, located in the southeast quarter of the northeast quarter of Section 31, 18 South, 33 East.

Q. Would you identify Exhibit 1 for the Examiner?

A. Exhibit 1 is the form C-108 that we filed with the Division, and we have numbered the pages to give easy reference to those, in the bottom right-hand corner.

Q. Okay. What is the current status of Mr. Enfield's proposed injection well?

A. The well is a Queen producer, drilled in December, 1992. It is a marginal producer, but it has been properly cased and cemented, and we do not believe that it will present any problems, as far as injecting water into that zone.

Q. Would you please summarize the proposed injection operations?

A. On page 2 of the exhibits, we anticipate that

we'll be injecting at approximately 250 barrels of water per day, this water being from other producing wells on the Hudson lease operated by Mr. Enfield. There may be some additional water later on, but initially we're talking about 250 barrels of water per day.

Q. Okay. What will be the initial injection pressure?

A. According to the Division rules, we will be limited to the initial injection pressure of 885 p.s.i.

Q. Okay, and later with Division approval, you may seek with step-rate tests additional or an increased injection pressure?

A. If need be, yes, sir.

Q. Is there a stimulation program proposed for the injection well?

A. Not unless we need to do some clean-up on the face of the formation, which would just simply be an acid wash treatment.

Q. Okay. Moving on to page 5 of the form C-108, the land plat, and then page 6, which lists certain well data, how many wells are there in the area of review, the half-mile area of review?

A. Within the half-mile there are five wells, in addition to the proposed injection well. We have listed those on page 6. One of them was P-and-A'd upon drilling,

and another one, we believe the Yates Atlantic 32 Number 2, is -- our latest information did not show it to be producing at this time. The rest of the wells are producing wells.

Q. And they are producers from the Penrose-Queen?

A. That's correct.

Q. The P-and-A'd well, the Atlantic 32 State Number 3, was that properly P-and-A'd?

A. From all appearances from what was reported to us, it was properly plugged.

Q. Okay. And as to the other non-plugged-and-abandoned wells, have they been properly completed and will they prevent the movement of injected fluids to other zones?

A. Yes.

Q. Okay. Now, as I mentioned earlier, the injection will be in the producing zone. Do you anticipate any harm to the offset operators?

A. No, if there is any effect I believe it will be a positive one, that is, of adding energy to the producing formation that may have the effect of greater producing rates on the affected producing wells.

But the well is far enough away that I really doubt that there's going to be any effect with this rate of injection.

Q. And why is that? Is that because of the nature of the Penrose sand in that area?

A. The Queen is fairly tight, and it has been found that the zones of permeable porosity are not contiguous on very great distances, and that's the reason why the Queen waterfloods typically are on much closer spacing than other waterfloods.

Q. Have you had experience in Queen waterfloods in southeast New Mexico and west Texas?

A. Yes, sir, I've been involved in quite a number of Queen waterfloods, beginning in 1959 with the Concho Bluff Queen and many others over that period of time, up until the last few years where i've been involved in infill drilling in Queen waterfloods to put them on closer spacing and enhancing the recovery.

Q. In fact, the hearing right before this hearing involved a Queen waterflood, didn't it?

A. Yes, with additional and closer spacing.

Q. What are the producing rates of these offset Queen producers?

A. The Yates Number 4 well, the last couple of months that I have, is producing 8 to 9 barrels a day. As I mentioned, I don't show any production on the Number 2 for -- since 1994.

The Chi-operated wells, the Number 1 is five to

six barrels a day the last couple of months, and the Number 2 well is one to two barrels a day.

Q. Okay. And I notice on page 6 of the form C-108, you give some completion dates. These wells were drilled in 1991 and 1992; is that correct?

A. That's correct.

Q. And in this area there has been no Queen or Penrose development in the last, say, three and a half years?

A. That's correct.

Q. Are there any sources of fresh water within a mile of the proposed injection well?

A. No, sir, the closest water well that we found that had been permitted is about a mile and a half to the north, and I don't believe it's active.

Q. Do you have a quarter-quarter section for that?

A. The northeast of the northeast of Section 30, I believe it is. Yes, northeast-northeast, Section 30, 18-33.

Q. And was the data regarding freshwater wells in this area obtained from the New Mexico State Engineer?

A. Yes.

Q. Are there any open faults or other connections between the disposal zone and any drinking water sources in this area?

A. Not that I'm aware of.

Q. What is the source of the injection water?

A. The produced water will be coming from wells that are completed in the Bone Spring, the Wolfcamp and the Queen.

Q. And they will be only from Mr. Enfield's lease?

A. Yes.

Q. So there will be no off-lease water coming in?

A. That's correct.

Q. Is the injection water compatible with the formation water, to the best of your knowledge?

A. We expect it to be. We will have a closed system and do not see anything in the analyses that would appear to cause any problems, as far as compatibility is concerned.

Q. Now, this Application was initially filed as an administrative application; is that correct?

A. That's correct.

Q. And is Exhibit 2 my affidavit of notice regarding the mailings given to the offset and the surface lessee?

A. Yes.

Q. In your opinion, is the granting of this Application in the interests of conservation and the prevention of waste?

A. Yes, sir, the hauling of water from these

producing wells is going to raise the economic limit considerably, and therefore leave economic oil behind if we do not have a cheaper way of disposing.

Q. And was Exhibit 1 prepared by you or under your direction?

A. Yes.

MR. BRUCE: At this time, Mr. Examiner, we would move the admission of Enfield Exhibits 1 and 2.

EXAMINER STOGNER: Any objections?

MR. KELLAHIN: No objection.

EXAMINER STOGNER: Exhibits 1 and 2 will be admitted into evidence at this time.

Thank you, Mr. Bruce.

Mr. Kellahin, your witness.

MR. KELLAHIN: Thank you, Mr. Examiner.

CROSS-EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Akins, if you'll turn with me, sir, to page number 3 of Exhibit 1, this is the proposed disposal well, wellbore schematic, is it not, sir?

A. Yes, sir, it is.

Q. The existing perforations are found at 4423 to 4432?

A. That's correct.

Q. And that would put it in the Penrose interval of

the lower Queen formation?

A. Yes.

Q. Does Mr. Enfield intend to add any additional perforations to the disposal well?

A. Not at this time.

Q. You said that it was still producing oil?

A. Yes.

Q. What kind of current rate do you have?

A. Probably two barrels a day or less.

Q. What did it cum?

A. I believe it cum'd -- it was only -- It was about 5000 or 6000 barrels to date. Let me find it for sure here. Yes, about 6200 barrels.

Q. Have you projected as a petroleum engineer remaining recoverable oil for this well?

A. The well is essentially at its economic limit at this time, and so additional oil, economic oil, is not significant.

Q. When this well was completed, was it fracture-stimulated?

A. Yes, it was.

Q. And that is typical of these wells in this area, is it not, sir?

A. That's correct.

Q. Do you know whether or not the wells in 32, the

north half of which is operated by Heyco and the south by Chi, if all those wells were frac'd in the Penrose?

A. Yes, they were.

Q. Do you know what the net pay thickness was in terms of height in the infill well in the Penrose?

A. It depends upon your cutoff as far as porosity is concerned, but something on the order of eight feet.

Q. About eight feet?

A. Yes, over a gross interval of 62 feet, I believe.

Q. All right. The gross interval, I think, as you've shown in your C-108 exhibit, I think you estimated for us is about 62 feet?

A. I think that's right.

Q. That's the gross interval?

A. Yes.

Q. At this particular well it's about a net of eight, using what cutoff?

A. I believe it was eight-percent cutoff that we used for that.

Q. Do you have an opinion as to what is the range of permeability for the Penrose interval in this immediate vicinity?

A. Outside of the influence of the fracture, it's quite low. I would say it's probably a millidarcy or less.

Q. Have you made any kind of engineering

calculations or studies to determine the suitability of this Penrose to take the produced water?

A. No, as it is true in most cases, injectivity is something that you try and see what it is. To be able to calculate it is virtually impossible.

Q. Why are you choosing to use this well as a disposal well in the Penrose if it has such a low permeability?

A. It's a well that's available.

Q. Where are the wells that produce the water that you're intending to dispose of in this well? I'm looking at Exhibit Number 1 and page 5 of that map. Show me where these wells are.

A. Most of the wells, I believe, are to the north.

Q. Can you identify the wells for me?

A. In Section 30 to the north --

Q. Yes, sir, I'm in Section 30. Where in section 30 would I find a well?

A. The Number 2, up in the northwest quarter.

Q. Yes, sir, northeast-northwest, in Unit Letter C?

A. Yes.

Q. Okay, that's the Number 2, and what formation does that well produce from? That's a Bone Springs well, is it not?

A. I believe it is, yes, sir.

Q. Do you know at what current rate it's producing?
A. I don't have that available.
Q. Do you know if it makes water?
A. It makes water.
Q. What range of water to oil does it make?
A. I don't know.
Q. Have you done any economic analysis to determine what is the cost cutoff of expense for disposal that that well can endure?
A. Well, obviously if you're hauling water for $1.35 a barrel and you can inject it for eight to ten cents a barrel, it's substantial.
Q. Yes, sir, and what kind of oil rate are you getting on that well?
A. I don't have that handy.
Q. All right, sir, what's the other well? Is there another well?
A. There are other wells in Section 29, I believe.
Q. Is there any other well in Section 30?
A. I don't think -- Let's see, is that Number 3?
Q. Section 30, I see a gas well symbol by a number 3.
A. Yes. I don't know, does that produce water? The other wells being in Section 29.
Q. All right, help me in 29. Where are the wells?

A. The west half or southwest quarter of that section, there is a Number 4 and 5 well.

Q. Yes, sir, I see the Number 4. It looks like -- is that still a producing well? It looks like an abandoned gas well symbol.

A. I'm looking at the well right below that.

Q. All right, sir. Just above the 67, up to the north and east, that's the Number 4?

A. Yes.

Q. Okay, and what does it produce from?

THE WITNESS: Is that Wolfcamp?

MR. ENFIELD: No, that's Queen.

THE WITNESS: Queen. And the 5 is Queen also.

MR. ENFIELD: The 4, 5 and 6, also -- 7 --

EXAMINER STOGNER: Gentlemen, only one -- We've got one witness up here. If he's not prepared, perhaps we need to take a recess, Mr. Bruce.

MR. BRUCE: Well, perhaps -- Mr. Enfield is here and he could tell exactly what wells, if that would help Mr. Kellahin.

MR. KELLAHIN: Well, let me finish my discussion with this witness, then.

Q. (By Mr. Kellahin) In Section 29, you've identified the Number 4 well. You don't know what it produces from?

A. The Queen.

Q. The Queen?

A. I believe.

Q. All right. And what kind of rates do you get on it?

A. I'm sorry, I don't believe that is Queen. The 5, 6 and 7 are the Queen producers.

Q. All right, let's try to keep from being confused. In 29, then, we've identified the Well Number 4, which appears to be in Unit Letter K.

A. That's Number 7.

Q. That's the Number 7?

A. Yes, sir.

Q. All right, sir, the Number 7 well. And you don't know what formation that's producing from?

A. It's Queen.

Q. That's the Queen?

A. Yes, sir.

Q. All right. Give me the next well in 29 that you've got information on.

A. The Number 5 well to the south of Number 7.

Q. All right, it's in Unit Letter N, and it is what type of well?

A. It's a Queen.

Q. That's a Queen well. Do you have a rate on the

Queen well, Number 5?

A. About 700 to 800 barrels of oil a month.

Q. And what water rate?

A. 15 to 30 barrels a month, it appears.

Q. You said the Number 6 was also a Queen well?

A. Yes.

Q. And that is to be produced water from that well in this injection well or disposal well?

A. Yes.

Q. And what kind of rates do you have on it?

A. It makes about 100 barrels a day of oil and 25 to 100 barrels a month of water.

Q. Have you sought the assistance of a geologist, Mr. Akins, to make correlations for you with regards to the injection interval and its relationship to the offsetting Penrose wells in Section 32?

A. No, I have not. I believe it has been looked at by a geologist, but not for that purpose.

Q. All right, sir. Do you know what the drive mechanism is in the Penrose reservoir that's being produced in 32?

A. Solution gas drive.

Q. All right. Is there a gas cap in that reservoir?

A. Not that I'm aware of.

Q. You don't see any active water drive?

A. No.

Q. The water produced in the Penrose is inherently in the Penrose, isn't it?

A. That's correct.

Q. All right. There's -- Do you know what the structural relationship is with regards to the injection well and the offsetting producing Penrose well?

A. No, I do not.

Q. Have you attempted to calculate the remaining recoverable oil for any of the wells in 32, Section 32, to the east?

A. No, I have not.

Q. Do you have a set of reservoir parameters that you use as an engineer to calculate either volumetrics or to determine oil in place for the Penrose reservoir?

A. I would do it on an individual basis.

Q. And have you done that for any well in here?

A. No, I have not.

Q. What is currently being done with the produced water from Mr. Enfield's wells?

A. It's being hauled.

Q. Do you know what the other operators are doing with produced Penrose water in this area?

A. No, I do not.

Q. Do you know where the nearest disposal well is in

this area?

A. No.

Q. Have you attempted to make any type of calculations to determine how long and how far it will take for the injection water at 1500 barrels a day to migrate from the wellbore?

A. No, I have not.

Q. Do you know what direction that water would move?

A. No, not except intuitively towards those pressure sinks that are in the reservoir, that is, towards other producing wells.

Q. And the only -- the immediate other producing wells for which there's a pressure sink would be in Section 32, would there not?

A. That's correct.

Q. There are no Penrose-Queen producers in Section 31, other than Mr. Enfield's well that he proposes to convert to disposal?

A. That's correct.

MR. KELLAHIN: All right, no further questions.

EXAMINER STOGNER: Thank you, Mr. Kellahin.

EXAMINATION

BY EXAMINER STOGNER:

Q. Mr. Akins, on the cumulative production number again on the proposed well, that has produced what? You

say 6200 --

A. Yes.

Q. -- barrels of oil?

A. Oil.

Q. Do you have the water production on that?

A. Not a cumulative. Let me -- I can probably estimate quickly here. It appears to be about 12,000 barrels.

Q. And the injection rate, you said, was going to be 250 barrels of water per day?

A. Yes, sir.

Q. Now, is that maximum or is that average?

A. That's approximately -- the average amount of water that's being produced from those wells from which we would take the water.

Q. Okay. What is the present disposal method of those wells up to the north?

A. The water is being hauled to a commercial injection well.

Q. And how far away, roughly?

A. I don't know where the well is. But it's quite a circuitous route just to get out to a paved road from this particular lease, and the cost is $1.35 per barrel, which indicates to me it's a fair distance.

EXAMINER STOGNER: No other questions.

Mr. Bruce?

MR. BRUCE: I have no other questions.

EXAMINER STOGNER: You may be excused.

Anything further, Mr. Bruce? You do not have anything further?

MR. BRUCE: I do not have anything further.

EXAMINER STOGNER: Mr. Kellahin?

MR. KELLAHIN: Yes, sir.

FRANK MESSA,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Would you please state your name and occupation?

A. My name is Frank Messa. I'm a geologist with Harvey E. Yates Company in Roswell, New Mexico.

Q. Mr. Messa, would you summarize for us your education?

A. I have a bachelor of science degree in geology from Texas A&M University, master --

Q. What year did you obtain that, sir?

A. 1984. Master of science in geology, University of Tulsa, 1988.

Q. Summarize for us your employment as a professional geologist in the oil and gas industry.

A. I began working for Amoco Production Company Research Center in Tulsa, Oklahoma. I worked there for four years. Then I went to work for Harvey E. Yates Company in December of 1989, so I've been here for six years.

Q. As part of your duties, are you accustomed to preparing cross-sections, making isopachs, preparing structure maps, and correlating producing intervals among and between wells?

A. Yes.

Q. Have you spent your time working for Heyco by doing geologic evaluations and studies in southeastern New Mexico?

A. Yes, I have.

Q. Have you made yourself knowledgeable about the Queen formation and about the Penrose producing interval within that formation?

A. Yes, I have.

Q. As a result of those studies, have you prepared certain maps and formed certain opinions and conclusions concerning this Application?

A. Yes, I have.

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

EXAMINER STOGNER: Any objections? Mr. Messa is

so qualified.

Q. (By Mr. Kellahin) Mr. Messa, let's talk about the conclusions.

Have you examined the geologic relationship of Mr. Enfield's proposed disposal well and its relationship to the offsetting Penrose wells in Section 32, the north half of which are operated by Heyco and the south half are operated by Chi Energy?

A. Yes, I have.

Q. And what conclusions have you reached about the correlation of those producing intervals in the Penrose to the proposed injection interval?

A. The conclusion is that the proposed injection interval is the exact same correlated interval in the Heyco wells.

Q. When you identify the structural relationship of the injection well and its proposed perforations to the current perforations in the Chi wells to the south, will the injection well or disposal well be injecting water upstructure to the producing wells in the south half of 32?

A. Yes, it will be upstructure to the wells in the south half of 32.

Q. So water injected in the Penrose formation would be upstructure to the oil being produced in the offsetting property --

A. Yes.

Q. -- in the south half?

In the north half, what's the structural relationship between the disposal well and the wells operated by Heyco?

A. The Enfield well is flat to slightly updip to the -- Excuse me, flat to slightly downdip to the wells in Section 32, the Heyco wells in Section 32.

Q. Geologically, what conclusion have you reached about the probability that water injected in the Penrose interval in the Enfield well is going to migrate to and encroach upon the oil being produced in Section 32?

A. I feel like that the water injected into the Enfield well will migrate toward the Heyco wells in Section 32.

Q. Do you see any geologic event or feature within this immediate vicinity to provide a barrier to that horizontal flow?

A. No, I do not.

Q. Do you find sealing faults or any other geologic impediment by which that water injected into the Penrose is going to move towards Section 32?

A. No, I do not.

Q. When you look at the size and the shape of the Penrose container, is there any indication to you that that

reservoir extends further west than the location of the proposed disposal well?

A. No.

Q. Does that give you any kind of geologic clue as to the potential direction of migration of that injection water, geologically?

A. Yes, it does.

Q. And what is it?

A. The direction would be to the east, towards the Heyco wells, by virtue of the fact that the Enfield well is on the edge of the reservoir.

Q. Geologically, Mr. Messa, what is your conclusion about the appropriateness of approval of this well for disposal in the Penrose interval?

A. It makes me very uncomfortable, because these wells are productive from the same interval, and we are concerned about the water being produced as it is now, and we don't want any added worries to these wells.

Q. Do your wells, as the well -- as the Chi wells, produce water?

A. Could you repeat that?

Q. Yes, sir. Do the Heyco wells and the Chi wells in 32, in association with the oil produced out of the Penrose, also produce water?

A. Yes.

Q. The water is inherent in the Penrose formation, is it not?

A. Yes, it is.

Q. Is there a structural component to the reservoir such that there is a water leg and an oil leg in the reservoir?

A. No, there is not.

Q. There is not an oil-water contact associated with this Penrose?

A. No.

Q. Okay. When you look at the relative thickness and examine the thickness relationship between the Enfield well and that relationship as we move farther to the east in 32, what is that relationship?

A. The thickness of the interval remains roughly the same.

Q. Let's turn now to your Exhibit Number 1. This first cross-section is an A-A' cross-section. This is your work product, is it not, sir?

A. Yes, it is.

Q. Let's start with the locator map. Show us the wells you've tied into your cross-section, and then let me ask you some questions about the cross-section.

A. This is a west-to-east cross-section. The well on the extreme left is the Enfield well, and it goes

through the Heyco Atlantic 32 State Number 2, to the Number 4 and to the Number 1.

Q. All right. The cross-section, then, will tie in the proposed disposal well with the three Heyco wells in the north half of 32?

A. Yes.

Q. All right, let's start with the Enfield well. Its perforations are 4423 to 4432. Do you see that?

A. Yes, I do.

Q. All right. And you've identified in yellow a correlation, did you not?

A. Yes.

Q. Take us through the yellow line and show us how you've made the correlation.

A. Okay, there is a distinct porosity peak that is right at the base of this dolomite, and you can see it at 4420 -- right about where the thickness -- where the thick line is. That particular sand member of the Penrose has a very distinct log character.

And as you go to the east, you see the same dolomite character above it, and you see the sand character where the -- where what's colored yellow. And that's a very straightforward correlation.

Q. You move into the Heyco well, the next one, Number 2, it shows a relative perforation in the yellow

interval of the Penrose?

A. Yes, it does.

Q. When we look at the Penrose, you've got a marker above and below the yellow zone. It says top of Penrose, and then below the yellow marker there is what I presume to be the bottom of the Penrose? Am I reading this correctly?

A. Yes, that is correct.

Q. When we look at that entire Penrose interval, then, is that the gross interval that Mr. Akins is alluding to when he's identified it as having an approximate gross thickness of 62 feet in the Enfield well? Are we talking about the same thing?

A. I would have to agree with that, but without talking personally with Mr. Akins I couldn't tell you exactly what his 62-foot --

Q. All right.

A. -- thickness would have correlated --

Q. In the Heyco well, the Number 2 well, that gross Penrose interval within which you've got this yellow high-porosity interval, if you will, is there anything to separate that yellow high-porosity interval from the rest or the balance of the Penrose sand?

A. Only just above that. But below it, no, there is no permeability separation below it.

Q. Within the gross Penrose interval, then, is there

going to be any barrier to fluid flow?

A. In my estimation, there would be no barrier to fluid flow from what's colored yellow and below.

Q. All right. So injection water put in the Enfield well has the opportunity to migrate not only in the yellow area, but within the entire Penrose interval?

A. Yes.

Q. Are all these wells fractured in here?

A. Fracture-stimulated?

Q. Yes, sir.

A. Yes.

Q. Okay. Take us over to the third well on the cross-section. It's the Heyco Number 4. You've made a similar correlation, and what do you conclude?

A. I've concluded that that is the same interval that is perforated in the Enfield well.

Q. All right, and then finally we get over to the last well on A'; it's the Heyco Number 1. You've got a correlation, and now you've got the Heyco State 1 perforation within the Penrose Interval, but below the yellow zone, right?

A. Yes, I do.

Q. All right. Tell us what you're showing.

A. That particular interval was fracture-treated as well. Even though it is not perforated within the exact

same sand, it is perforated within the gross interval that should have a porosity and permeability communication to the yellow zone above.

Q. All right. Geologically, then, it would be your conclusion that while the perforations in the Number 1 well are slightly below the yellow streak, in fact, water injected into that yellow interval is going to communicate and affect production in the Number 1 well?

A. In my estimation, yes.

Q. All right. No reason to separate it out, you see no geologic reason that that should not be communicated?

A. No.

Q. All right. Let's go to the next exhibit; it's Exhibit Number 2.

Q. Please identify the Exhibit Number 2 for us, Mr. Messa.

A. Exhibit Number 2 is a west-to-east cross-section, beginning with the Enfield well in Section 31 and going through the two Chi-operated wells, the Bison State Number 1, and the Bison State Number 2.

Q. We are looking at a structural cross-section, constructed in a similar fashion, using the same marker points as you did when you prepared the structure map, Number 1?

A. Yes.

Q. All right, lead us through the correlation and show us what you've concluded.

A. Again, picking the top of the Penrose interval, it can be correlated from the Enfield well to the other two wells, the very distinctive dolomite that's right below that, it can be correlated, which the dolomite marks the top of the yellow.

The yellow is correlated to the high porosity, and that is a fairly straightforward correlation as well.

And then the base of the Penrose is picked at the base of the sand.

Q. What's the quality of the logs that you're using for Exhibits 1 and 2 in terms of your ability to read and interpret those logs and make this type of correlation in an accurate way?

A. These are very recent modern logs. I have a very high degree of confidence in these data, so I feel like -- very, very confident with this.

Q. With regards to the Chi-operated wells, do you see any geologic limitation or reason that injection water in the Enfield well is going to do anything other than migrate towards the producing wells in Section 32?

A. No, I do not.

Q. Based upon your analysis and your correlations, have you then prepared a structure map within this

immediate vicinity insofar as it affects these wells?

A. Yes, I have.

Q. Mr. Messa, I've shown you what is marked as Exhibit Number 3. Can you identify this as your work production, being your structure map?

A. Yes, I can.

Q. All right, let's do that, then. Before we talk about the conclusions, help us understand how to read the color code. What's the significance of the color code?

A. The color code, since this is a structure map, it shows updip to the west, the lighter colors being -- showing updip.

As you go down the color code, through the end of the spectrum on the east, you see that it is basically a downdip direction that way, so we see -- we're looking at a structure map that shows updip to the west, downdip to the east.

Q. It's simply computer-generated and with the color code, then, we can define the contours of the structure?

A. Yes, that's correct.

Q. All right. Help us understand the structural relationship now, when we identify the proposed disposal well, which is shown by the arrow, and its relationship, then, to the offsetting wells in 32.

A. Okay, if we follow cross-section A-A', you see

that the Enfield well, labeled HUD-1, is in pretty much a strike direction to the Atlantic State Number 2, slightly updip to the Atlantic Number 4, and slightly downdip to the Atlantic Number 1.

As you follow along cross-section B, you see that the Enfield well is updip to botn the Bison 1 and the Bison 2.

Q. Summarize for us your conclusions, Mr. Messa.

A. The conclusion is that the Hudson well, being perforated in the same producing interval that the Heyco wells and the Chi Energy wells, in my estimation, would have an adverse effect on the production. I feel like there's no direction for that water to go but toward those wells, and that is not what we would like to see happen.

MR. KELLAHIN: That concludes my examination of this witness.

We move the introduction of his Exhibits 1, 2 and 3.

EXAMINER STOGNER: Exhibits 1, 2 and 3 will be admitted into evidence.

Mr. Bruce, your witness.

CROSS-EXAMINATION

BY MR. BRUCE:

Q. Mr. Messa, what are the current oil and water producing rates from Heyco's wells, the Number 2 well?

What's the status of that well?

A. The Number 2 well is shut in.

Q. What do you intend to do with that well?

A. I'd have to refer that to our next witness. I'm the geologist, and our engineer will speak to that.

Q. Okay. Is it shut in because it was uneconomic?

A. Yes.

Q. And what's the status of the Number 4 well?

A. The Number 4 well is a producing well.

Q. And what are the producing rates?

A. Again, I'd have to refer you to our engineer.

Q. Okay. And you don't know anything about the Number 1 well either?

A. Only that that was the discovery well.

Q. You don't have data on the cumulative production or current water and oil producing rate?

A. Well, I've got some cumulatives as of May of 1995, I believe. It's shown on the cross-section, but the current, up-to-date information the next witness will have.

Q. Have you been involved in any Queen waterfloods or pressure-maintenance projects, Mr. Messa?

A. No, I have not.

Q. You have not. Are they common in southeast New Mexico?

A. I would say yes, they are.

Q. Is the Penrose tight?

A. Tight?

Q. Yes.

A. I have researched two fields nearby, the Querecho Plains Queen, which is about three miles to the west, and the EK Queen, which is about six miles to the northeast, and found that the permeability is in the 10-to-31-millidarcy range, which I would not consider tight.

Q. Is the Querecho Plains Queen waterflood successful?

A. I don't know that there is a waterflood there.

MR. BRUCE: For the record, Mr. Examiner, there is a Querecho Plains Queen waterflood. It was approved by the Division a couple years ago.

EXAMINER STOGNER: So noted.

Q. (By Mr. Bruce) And on the Queen waterfloods or pressure maintenance, do you believe it's -- do you have an opinion on waterflooding the Queen for enhanced recovery? Is it reasonable?

A. No, I have no opinion.

Q. No opinion. Do you know what the distance is from the proposed injection well to Heyco's nearest producing well?

A. Without a scale -- this map is a 1-to-12,000 -- that distance there is -- I'll take it back; it's on the

cross-section.

It would be 2200 feet, 1400 plus 800.

MR. BRUCE: I'll save my questions for the engineer, Mr. Examiner.

EXAMINER STOGNER: Okay.

EXAMINATION

BY EXAMINER STOGNER:

Q. Mr. Messa, in the two cross-sections that you supplied, one goes down to the southeast and the other goes to the northeast. Is there any indication that the reservoir porosity changes as you move back to the east, either to the south or to the north from the proposed injection well?

A. Yes.

Q. And how does that change?

A. The porosity increases towards the east.

Q. Towards the east. How about in a southern or northern direction?

A. I could not tell you in a northern direction. And in the south direction, no, there's no well control to confirm that.

Q. Would it be your opinion that water would flow downhill in this instance? Wouldn't it go down to the east southeast as opposed to the east -- I mean to the northern direction, toward the Heyco wells?

A. I would expect it to go to the northern direction because of the increase in porosity and because of the increased permeability in that direction.

Q. Does it not increase as you go a little bit south, toward the Chi wells?

A. Okay, that would be to the south and east.

Q. Yes.

A. East southeast, but to the south I could not tell you.

Q. Okay, well -- Okay, east southeast toward the Chi wells, wouldn't it more likely go in that direction, since it's more downdip and I'm assuming that the porosity is the same, according to your answer?

A. I think the answer to that question would be beyond the scope of what we're trying to answer here. I mean, I can't tell you if it's going to go to the Bison wells before it would go to the Atlantic State wells. All I can tell you is that the porosity and permeability are increasing in that general direction.

Q. You stated in your latter part of your testimony with Mr. Kellahin that you wouldn't want to see the water injected in this well. Why not?

A. I would not want to see water encroach our wells. Those wells are marginal now. We don't need anything else to encourage those wells to be any more marginal.

Q. And this well -- water disposal in this well would do that?

A. I believe so, yes.

Q. To what degree?

A. I can't tell you the degree. It could be -- We could see the water in six months, we could see it in a year, we could see it in a couple of weeks.

Q. Would it necessarily have to fill up that void that was left down there that was left from the original production before it saw any encroachment toward the east?

A. I think we would be theorizing if we say that there's a void down there. The model that I have wouldn't necessitate a void from where the oil has been produced. The void is being replaced with water anyway. So it's not like you produced the oil out of the ground and then leave an empty space down in the formation.

Q. It's not?

A. Not in my model, no.

Q. Well, how about in actuality?

A. I would say the same thing in actuality.

EXAMINER STOGNER: Any other questions of this witness?

Mr. Bruce?

MR. BRUCE: Yeah, I forgot to ask Mr. Messa one thing.

FURTHER EXAMINATION

BY MR. BRUCE:

Q. During your testimony -- Looking at your Exhibit Number 3 -- maybe that would be the easiest place -- you said Mr. Enfield's well was pretty much at the western boundary of this reservoir.

A. I believe so, yes.

Q. Does the reservoir extend to the south in Section 32, below the Chi wells?

A. In my estimation, no, it would maybe -- if there would be any extent to it, it would be very, very close to those two wells.

Q. Okay, what about the northwest quarter? Does the reservoir include all of the northwest quarter of Section 32?

A. I would say no.

Q. Where would the boundary be?

A. The Bison wells would define a southern boundary or a very short distance away from those wells. The Atlantic 2 and the Atlantic 4 define within a few hundred feet, I would estimate to the northwest, the northwestern edge, and then it appears to go farther to the north where the wells in the south half of Section 29 are located.

Q. Okay. So roughly the northwest quarter of the northwest quarter of Section 32 would not be in the

reservoir?

A. That is correct.

Q. Just roughly speaking?

A. Roughly, yes.

Q. What about in the northeast quarter of Section 32?

A. I would say that it's probably not present there either.

Q. Is that based on that well in the northwest quarter of the northeast quarter? Was that deep enough to reach the Penrose?

A. I don't believe that well was deep enough to reach the Penrose.

Q. What I'm getting at is, basically Heyco's lease in the north half of Section 32 has been fully developed on the Penrose?

A. I would say yes.

Q. Thank you.

A. Okay.

FURTHER EXAMINATION

BY EXAMINER STOGNER:

Q. While we're on that, the Number 3 well, as it appears in the map, in Section 32 in the northwest-northwest quarter, shows to be plugged and abandoned. Do you know anything about that well, or did you utilize it

for your data collection for your information provided?

A. I did not use that well. Being a dryhole, it was out of the reservoir. I think that also defines the extent of it.

Q. Dryhole in that there was no porosity there?

A. That is correct.

Q. Or dryhole because it was watered out?

A. No, they lose porosity, and that's -- that's pretty much how you define the reservoir extent. Porosity and permeability.

Q. Perhaps you need to go over on Exhibit Number 3, then, what the different colors mean, because if that's a dryhole, why is it in the blue area?

A. Okay, the colors are just representing a color scale from updip to the northwest and downdip to the southeast. So, you know, it's just -- If you were looking at a colored topographic map, this might look like something you've seen before. So...

Q. Okay, so the colors really don't represent anything other than a topography change, essentially?

A. Yes.

EXAMINER STOGNER: Okay. Any other questions of this witness?

You may be excused.

Mr. Kellahin?

MR. KELLAHIN: Call Steve Yates.

STEVE YATES,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

A. My name is Steve Yates. I work for Harvey E. Yates Company.

Q. In what capacity, sir?

A. As a petroleum engineer and also as vice president.

A. Summarize for us your education.

A. I graduated from Tulane University with a BS in chemical engineering in 1982.

Q. Summarize your employment experience in the oil and gas industry.

A. After graduation, I worked for Shell Oil for five years and then joined Harvey E. Yates Company and have been there for nine years.

Q. As part of your duties, do you regularly manage and supervise production of wells such as the Penrose wells in 32?

A. Yes, I do.

Q. As part of your duties, do you keep track of production histories and use those histories and other informations by which to forecast and determine remaining recoverable hydrocarbons in your wells?

A. Yes, I do.

MR. KELLAHIN: We tender Mr. Yates as an expert witness.

EXAMINER STOGNER: Any objections? Mr. Yates is so qualified.

Q. (By Mr. Kellahin) Mr. Yates, Mr. Akins a while ago suggested that if anything you are going to receive a positive benefit from having water injected 330 feet from your common property line and that you ought to thank Mr. Enfield, I guess, for the opportunity to help you. What is your opinion?

A. That suggests to me a waterflood, and I at this point could not concur that we're talking about a waterflood here. We're talking about saltwater disposal. We would have no control over rates, pressures. And so to the extent that we would have any positive benefit, I can't conclude that at this point.

In fact, my knowledge of Queen floods is that some are successful, and injection into the Queen formation can break through and channel, and that is our concern, that it would break through and channel, increasing water

production in our producers.

Q. Give us an understanding of your opinion as to what you think will happen if the Division approves this well for disposal. Where is that water going to go?

A. We've fairly well defined the reservoir by our wells, Enfield's well, the Bison/Chi wells. The water is going to go into that formation. Eventually, we will be producing it, they'll be injecting it and we'll be producing it, so long as our producers continue to produce and are economic.

Q. What do you currently do with the water that you produce from your wells and that Chi produces from theirs?

A. I imagine Chi -- and I can't speak for Chi, what they do with theirs. But we haul our water away, it's trucked off.

Q. All right. Are you paying the same kind of rates that Mr. Enfield is paying when he disposes of water produced from his Queen well that makes some 700 barrels of oil a day?

A. Unfortunately, we are.

Q. All right. So you're all exposed to the same economic constraints, then, with regards to saltwater disposal?

A. Essentially, yes, sir.

Q. All right. Mr. Stogner was inquiring of Mr.

Messa whether or not it was reasonable in this reservoir to expect that the water injected might position itself downstructure in the reservoir so that you, I guess, would have some separation, where the oil would stay in an oil column and the water would be below the oil in some kind of water leg. Would that happen in this reservoir?

A. It could, but what we're looking at are porosity streaks. Mr. Stogner asked about, would it flow downhill? Certainly it would flow downhill as well. It could very well flow uphill. We're injecting into the same -- as Mr. Messa showed in his exhibit, a yellow band of porosity streak.

That is our concern, is it does channel and follow those porosity streaks into our wells. We also have an overriding royalty interest in the Bison wells, and those being downdip, the water may very well go downdip direction as well.

Q. Let's talk about some of your wells, the ones that you operate. Let's go into the north half of Section 32. I'm going to show you what I've marked as Exhibit 4. It deals with your Atlantic 32 State Number 1 well. Identify for us what we're seeing here, Mr. Yates.

A. Exhibit Number 4 is a plot of production oil and gas, prepared as part of a reservoir decline curve analysis of our reserves.

Q. It does not show water production?

A. It does not show water production.

Q. Give us a sense of the relationship of the oil production to the rate of water production in this well.

A. In this particular well, the Atlantic 32 State Number 1, little if any water production currently. I think it's cum'd about 700 to 1000 barrels of water.

Q. What do you forecast to be its remaining productivity, based upon the decline curve?

A. Well, following this decline curve analysis for the reserves -- and you'll see at the bottom left of this exhibit the cumulative oil produced as of the summer of 1995 -- our engineer has forecast remaining reserves of 72,000 barrels from this formation.

Q. Have you provided information to the Division with regards to the economics of those reserves for the Number 1 well? I'm sorry, I think I've got these -- I've got these out of order, Steve. Let's do it this way.

The Number 4 we're looking at -- We'll take these exhibits out of order, Mr. Examiner. Number 7 goes with Exhibit Number 4. These are the economics.

Give us a point of time for reference with regards to the reserve spreadsheet here, Mr. Yates.

A. This spreadsheet was prepared as of July 1st, 1995. The remaining reserves was prepared by Robert Lee,

Lee Engineering.

Q. All right. So when we look at that point in time, when we read the spreadsheet, if we go down the rows and we find a total, and let's just look at -- ignore the gas for a moment, and let's look at the oil production. A total of, I guess, 35,822, do you see that number?

A. That's correct.

Q. At that point in time, what does that number represent?

A. That represents the projected recovery from the Atlantic 32 State Number 4 well, from this formation as of July 1st, 1995, through the end of the life of this well, based on an economic projection.

Q. This would be the remaining oil to be produced from this well after July 1st of 1995? Is that how I'm reading it?

A. That's correct.

Q. All right. And then you can read across that row and you can put a value to that remaining oil production?

A. Given the oil prices and an escalation of oil prices, given the operating costs remaining fairly constant but with an escalation due to inflation, no unforeseen increases in those costs, yes, we would project a value.

Q. If water is injected into the disposal well and it communicates with the oil being produced from your

spacing unit from the Number 4 well, what is the level of reserves that are at risk?

A. It would certainly limit the amount of reserves that we would recover, depending on the response, how much water is actually channeled to our wells. It could very well cut these reserves by a quarter -- I mean to a quarter of them, you know, depending on the -- how much water is produced.

Q. Some half or all of it could be at risk; you just don't know, do you?

A. That's correct.

Q. Let's turn to the Number 4 well -- I'm sorry, we've talked about the Number 4. Let me turn to the Number 1 well.

I'm doing real good. I've confused myself, and now everybody. Let me give you the rest of the spreadsheets, and then we'll match them up.

Exhibit 6 is the production decline curve for the Number 4 and so I've misspoken. Exhibit Number 7 is the Number 1.

(Off the record)

Q. (By Mr. Kellahin) I've misstated what you were testifying to, Mr. Yates. You were, in fact, describing the State Number 1 well when you were looking at Exhibit Number 4.

Let's look at Exhibit 6 now and look at the production history on the State 4 and have you show us what's happening with that production.

A. Once again, this is a decline curve or curve generated based on the history of the production from the Atlantic 32 State Number 4, as part of our reserve analysis. There are -- It depicts oil production, gas production, and the GOR in the curves.

Q. Again, it has a similar production profile as the Number 1 well. This is exclusive of water production, it doesn't show water production?

A. It does not show water production.

Q. What kind of relationship do you have for water production in this well?

A. In the Atlantic 32 State Number 4, initial water productions were -- well, based on cumulatives, about 10-percent oil cut -- I mean water cut, excuse me. Currently it's about 30-percent water cut.

Q. So over time you're seeing that the water cuts are increasing in this well?

A. I say that over time -- yes, that we have a decline in oil production.

Q. All right. Help me understand how this works in the reservoir. As the oil and the water are withdrawn, what replaces that voidage, if you will? We're not

creating a vacuum, if you will, in the reservoir?

A. Okay, we're not creating a vacuum.

Q. All right.

Q. Nothing really replaces it. It's a solution gas drive. The pressures -- at least water can move and flow in the reservoir.

Q. The gas will expand, then?

A. Gas will expand.

Q. In a solution gas drive reservoir, the gas expands to take up the space that has been left by the removal of the fluids?

A. That's correct.

Q. All right. Turn to the economics for that well. We have described economics for the first well. Describe for us what in your opinion are the remaining reserves at risk if this disposal well is approved.

A. Now, which well is this?

Q. We're talking about --

A. -- Exhibit Number 5?

Q. -- Exhibit Number 5.

A. Which would be that Atlantic 32 State Number 1.

Q. Yes, sir.

A. Once again, based on the decline curve analysis, we have estimated the remaining recoverable reserves, economic recoverable reserves, of almost 49,000 barrels, as

of July 1st, 1995. And that again has a value based on the projection of oil and gas prices and operating costs.

Q. Summarize your conclusions and recommendations to the Examiner, please.

A. I would conclude that -- I have concerns about water injection into the producing reservoir, in that that water would channel into these producing wells, and even though the current rates are fairly low, our projections of decline are fairly flat, and that it has a long economic life, unless our operating costs go significantly up or oil prices go significantly down. I can't control oil prices, but I would like to prevent additional costs from water production. It will essentially -- could essentially drown our wells.

MR. KELLAHIN: That concludes my examination of Mr. Yates.

We move the introduction of his Exhibits 4, 5, 6 and 7.

EXAMINER STOGNER: Okay, now, what's Exhibit 5? I'm missing that.

MR. KELLAHIN: Exhibit 5 is the economics on the Number 1 well.

EXAMINER STOGNER: Okay.

Any objections?

MR. BRUCE: No, sir.

EXAMINER STOGNER: Exhibits 4, 5, 6 and 7 will be admitted into evidence at this time.

Thank you, Mr. Kellahin.

Mr. Bruce, your witness.

CROSS-EXAMINATION

BY MR. BRUCE:

Q. Mr. Yates, could you give me the current oil and water producing rates of your Number 4 well?

A. Yes, sir, and these are dated 11-95 --

Q. Okay.

A. -- that I've brought with me.

The Atlantic 32 State Number 4, for the month of November of 1995, produced 274 barrels of oil, 250 MCF, and 81 barrels of water.

Q. And that's for a month?

A. That's for the month.

Q. So that was about nine barrels a day of oil?

A. That's correct.

Q. Okay, and your Number 1 well?

A. The Atlantic 32 State Number 1, for the month of November, produced 397 barrels of oil, 356 MCF, and no reported water.

Q. And what is the status of the Number 2 well?

A. The Number 2 well is currently shut in.

Q. What did that well produce, total?

A. The Number 2 well has cum'd 28,917 barrels of oil, 29,947 MCF, and produced 10,301 barrels of water.

Q. What is the economic limit on these wells, barrels of oil per day?

A. Three to five, depending on the costs.

Q. Could the Number 2 well be used as a monitor well, checking fluid levels?

A. Pardon me?

Q. Could your Number 2 well be used as a monitor well to check fluid levels?

A. For checking fluid levels?

Q. Yes. Or for checking any water encroachment that you're claiming?

A. In other words monitor -- You having 2 monitor the progress of injection --

Q. Yes.

A. -- from the Enfield well?

It could be a monitor well, yes.

Q. Now, I don't know if it was you, Mr. Yates, or Mr. Messa, said because Heyco didn't have control over injection rates, et cetera, it was uncertain about any waterflood or pressure-maintenance effect from Mr. Enfield's well. What rates and pressures would you suggest if you were going to use a well in a waterflood in this area?

A. I have not prepared and am not prepared to suggest that this is a floodable Queen-Penrose formation, so I wouldn't say.

Q. Of the Heyco and Chi wells, which ones do you think would show any -- if any effect, say pressure-maintenance effect first? Would it be the Chi wells? Would it be the Heyco wells? And which wells, which numbers?

A. Which would --

Q. Which would show the first effect of any injection into the Enfield well?

A. They both could equally see the first effect.

Q. Would it be the -- What? The Chi Number 1 well, and your Atlantic Number 4 well first?

A. Let me look at the -- I don't know, that is my concern. I mean, there's -- The channeling could go either way. Or we could talk about --

Q. Can you state for certainty whether channeling will occur?

A. No, I cannot state for certainty whether channeling will occur.

Q. Have you studied this field, this pool, for waterflooding?

A. No, we have not.

Q. Okay, you would admit there are a number of

successful Queen waterfloods in New Mexico?

A. Certainly.

Q. Okay. Based on that, indeed, what Mr. Enfield is stating could be true, that it could provide a beneficial effect for the Chi and the Heyco wells?

A. It could provide a beneficial effect.

Q. And I take it, based on what your geologist has said, Heyco has no plans for future Penrose development in the north half of Section 32?

A. Not that I'm aware of at this time.

Q. Have you made any calculation of any area affected by injecting water into the Enfield well at 250 barrels a day?

A. No, I have not.

MR. BRUCE: I have nothing further, Mr. Examiner.

EXAMINATION

BY EXAMINER STOGNER:

Q. Mr. Yates, when was the Number 2 well shut in?

A. Two years ago, approximately. April of 1994.

Q. And what was the production rate at the time of that well?

A. About two barrels of oil a day or less.

Q. And how about water?

A. I cannot recall water.

Q. Do you by chance have the cumulative production

on that well?

A. I do. The Atlantic 32 State Number 2 cum'd 28,917 oil, 29,947 gas, 10,301 barrels of water.

Q. And that well had produced for how many years, or how long?

A. I'm going to say -- and I can't recall when it was drilled, but around 1991, about three years, two to three years.

Q. Now, you show 19 to 20 years -- 19 and 21 years of productive life for the Number 1 and the Number 4, pursuant to your 5 and 7 exhibits.

A. Yes, sir.

Q. And the Number 2 well only produced for two years?

A. That's correct.

Q. Do you by chance know how long the Number 1 and 2 wells down in Chi Operating have been producing?

A. Off the top of my head, I'm going to say two to three years also.

Q. When the Number 1, 2 and 4 wells were put on production, was there any noticeable effects on the other wells? Was there any kind of communication that was noticed, or was there any effects caused by bringing the other well on production?

A. No, not that I was -- No.

Q. Do you know what the reservoir pressure, virgin reservoir pressure, was of this well?

A. No, sir, I don't.

Q. Do you know what it is now, roughly?

A. No, sir, I don't.

Q. But they're all on pump?

A. They're all on beam pump.

Q. Were they initially put on pump?

A. Yes, they were.

Q. Does Yates, Harvey Yates, have any proposal on that Number 2 at this time? Is it plugged and abandoned, or what's keeping it open at this point?

A. Well, we're researching an asphaltine problem in it that --

Q. I'm sorry, what?

A. An asphaltine problem. In other words, a very heavy gravity crude, but mixing of waters precipitating out and causing a near-wellbore loss of permeability.

Q. In the Penrose or another formation?

A. In the Penrose.

Q. What does that entail?

A. Trying to take some -- do some chemical analysis and try to stimulate that well, based on the results of that. I'm not sure we can do much of anything.

Q. Is it sort of a huff-and-puff deal where you

would inject some chemical in the well and then turn around and try to produce it?

A. Correct. And I wouldn't characterize it as a huff-and-puff, it's just trying to remove the damage, if indeed that's what it is, the problem.

Q. Is that a commercially viable option?

A. I doubt it. When you say "a commercially viable option", the real question that I need to address is whether we think we can solve the problem and determine what that problem -- if it is an asphaltine problem, whether we can fix that, and --

Q. This asphaltine problem, is it just unique to this well, or are you trying to solve a problem throughout the whole pool?

A. I would assume that it would be in the pool, that it's -- if in theory that is what the problem is, a solution would be helpful for the entire pool.

Q. Is the west half of the northwest quarter, in your opinion, capable of producing oil or gas in commercial quantities at this time?

A. The west half of the northwest quarter?

Q. Yes, where the Wells Number 2 and 3 are located, from the Penrose?

A. No.

EXAMINER STOGNER: I have no other questions of

this witness.

MR. KELLAHIN: I'm intrigued with something here.

EXAMINER STOGNER: Mr. Kellahin?

FURTHER EXAMINATION

BY MR. KELLAHIN:

Q. When we talk about the asphaltine potential damage in the Number 2 well, that's a near-wellbore condition, is it not, sir?

A. Uh-huh, it is.

Q. Would I be able to characterize it as saying that those perforations in a near-wellbore area for the Number 2 have been so closed off that you no longer have access to the reservoir?

A. Either the perforations or the fracture itself, the frac -- stimulated the frac wing from the fracture itself.

Q. Asphaltine is just like a tarry, heavy oil substance?

A. That's correct.

Q. Would it be practical, then, to expect that you could take the Number 2 well in that condition and expect that it would detect or monitor any kind of fluid flow through the reservoir if this disposal well is in the neighborhood?

A. That's -- Good point. That's right, if that

would be the problem, it would be difficult to detect. In that particular well there would be no fluid entry --

Q. But if we're looking for --

A. -- for water or --

Q. -- a safety net --

A. Right.

Q. If we're looking for some kind of safety net so that we could detect the migration, the Number 2 well is not going to be the safety net?

A. That's correct.

Q. It will be plugged off in such a way that if there's water flow in and around and near it, we can't detect it?

A. Correct.

Q. All right. And even if it was in good shape, you could get water flow to the Chi wells to the south and never see it in the Number 2 well?

A. Correct.

EXAMINER STOGNER: Mr. Bruce?

MR. BRUCE: No.

FURTHER EXAMINATION

BY EXAMINER STOGNER:

Q. Mr. Yates, where is the present water disposal on your lease? Where is it going at this time?

A. I do not know.

Q. You're vice president, and you don't know what you're doing with your water?

A. Not this particular lease, not off the top of my head, sir.

MR. KELLAHIN: It's being trucked, is it not, Steve?

THE WITNESS: It's being trucked away.

MR. KELLAHIN: We'll find out where it goes, Mr. Examiner.

EXAMINER STOGNER: Mr. Bruce?

MR. BRUCE: I don't have any questions.

EXAMINER STOGNER: No other questions of this witness. You may be excused.

Anything further, Mr. Kellahin?

MR. KELLAHIN: No, sir, that's all the evidence we have to present.

EXAMINER STOGNER: Mr. Bruce?

MR. BRUCE: The only thing is, if you want some clarification from Mr. Enfield regarding which wells are producing and would be contributing to the disposal, he has that information.

EXAMINER STOGNER: Actually, I do want that. I was going to ask for that. Which wells --

MR. BRUCE: Okay, if we could --

EXAMINER STOGNER: -- or -- Okay, here's what I

want. I want which wells are going to contribute to the disposal and what volumes and what production history for the last couple of years. So I'm sure you don't have all that right now, but what you do have, go ahead and present it, and then we'll --

MR. BRUCE: Okay, if we could get Mr. Enfield sworn in --

EXAMINER STOGNER: Okay.

MR. KELLAHIN: Do you want to do that, or do you just want to submit it after we're done?

MR. BRUCE: Do you want to hear some of the --

EXAMINER STOGNER: Well, what we're looking at is just production history --

MR. BRUCE: Okay.

EXAMINER STOGNER: -- is that correct? And --

MR. BRUCE: Yeah.

EXAMINER STOGNER: -- formations and volumes?

MR. BRUCE: Okay.

EXAMINER STOGNER: I don't see any reason to prolong this out.

MR. BRUCE: Okay, we could just prepare an exhibit giving the wells and their oil and water producing rates, et cetera.

EXAMINER STOGNER: Okay. At this time we'll leave the record open for the submittal of that additional

information.

Anything further at this point?

MR. BRUCE: No, sir.

EXAMINER STOGNER: Any other statements?

MR. KELLAHIN: No, sir. I think the Division is aware of our concern. There's a statutory rule here with regards to premature drowning out of oil. The Examiner knows that it's 70-2-12 B 4. It's in one of the enumerated paragraphs, and that's our point.

EXAMINER STOGNER: And I've got it highlighted in blue right here in front of me, and --

MR. KELLAHIN: My only other point, Mr. Examiner, is to remind you that with a well this close to a common boundary, even in a pressure-maintenance or a waterflood project, you would not approve it as an injector in the absence of a lease-line injection agreement with the offsets.

So to propose that this disposal could be approved without some common lease-line agreement, I think, is inappropriate.

If the analogy is, this is some kind of benefit, it acts as a mini-pressure maintenance or a waterflood, then it couldn't even be approved under those processes without a lease-line agreement, and that's not taking place.

EXAMINER STOGNER: You brought up a point. I'm going to dispute that, Mr. Kellahin. I think you're referring to Rule 104 F somewhere where it talks about well locations for injectors. Isn't that 330 feet from the outer boundary of a lease or a unitized area?

MR. KELLAHIN: It's the common outer boundary lease-line injection well.

EXAMINER STOGNER: Right, but wouldn't that be that under 104 F 1?

MR. KELLAHIN: Is it not the practice to require a lease-line injection agreement for those wells along the boundary?

EXAMINER STOGNER: Only if they're closer than 330 feet to the outer boundary of that lease.

MR. KELLAHIN: All right, then I stand corrected, Mr. Examiner.

EXAMINER STOGNER: But still there are points brought up, and I'd like some sort of, perhaps -- if you want to do it in the form of a rough draft, please feel free, how this is going to be affected pursuant to that B 4 subparagraph and the Oil and Gas Act, about the premature drowning out of the strata that's capable of producing oil or gas in paying quantities.

MR. BRUCE: When would you like the proposed order, Mr. Examiner?

EXAMINER STOGNER: I'll leave that up to you gentlemen.

MR. KELLAHIN: All right, sir. Let us visit after the hearing, Mr. Examiner, and we'll work out a schedule for your approval.

EXAMINER STOGNER: Okay, and you can present that additional information at that time, if you would like.

With that, I'll leave the record open pending that information.

(Thereupon, these proceedings were concluded at 11:30 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11485 heard by me on 7 March 1996.

, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL March 11th, 1996.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1998