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 SAGA PETROLEUM, L.L.C., FOR STATUTORY UNITIZATION, LEA COUNTY, NEW MEXICO	CASE NO. 12,417
APPLICATION OF SAGA PETROLEUM, L.L.C., FOR APPROVAL OF A WATERFLOOD PROJECT FOR ITS CROSSROADS SILURO-DEVONIAN UNIT AREA AND QUALIFICATION OF SAID PROJECT FOR THE RECOVERED OIL TAX RATE PURSUANT TO THE ENHANCED OIL RECOVERY ACT, LEA COUNTY, NEW MEXICO	

ORIGINAL

CASE No. 12,417

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

September 7th, 2000

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner on Thursday, September 7th, 2000, 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

September 7th, 2000
Examiner Hearing
CASE NOS. 12,417 and 12,418 (Consolidated)

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* * *

A P P E A R A N C E S

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By: WILLIAM F. CARR

* * *

WHEREUPON, the following proceedings were had at 1:40 p.m.:

EXAMINER CATANACH: Call the hearing back to order, and at this time I'll call Case 12,417, the Application of Saga Petroleum, L.L.C., for statutory unitization, Lea County, New Mexico.

Call for appearances in this case.

MR. CARR: May it please the Examiner, my name is William F. Carr with the Santa Fe law firm Campbell, Carr, Berge and Sheridan. We represent Saga Petroleum, L.L.C., in this matter.

I would request at this time that you also call Case 12,418. It's the Application of Saga Petroleum for approval of a waterflood project. A waterflood project area is the unit area which is the preceding case. I would request that case be called and they be consolidated for the purpose of testimony.

EXAMINER CATANACH: At this time I'll call Case 12,418, which is the Application of Saga Petroleum, L.L.C., for approval of a waterflood project for its Crossroads Siluro-Devonian Unit Area and qualification of said project for the recovered oil tax rate pursuant to the Enhanced Oil Recovery Act, Lea County, New Mexico.

MR. CARR: Mr. Examiner, at this time we would

request that the portion of Case 12,418 which relates to qualification of the project for the recovered oil tax rate be dismissed.

EXAMINER CATANACH: Okay. Mr. Carr?

MR. CARR: Mr. Examiner, Saga is before you today seeking statutory unitization of the Crossroads-Siluro-Devonian Unit area. The area was unitized approximately a year and a half ago as a voluntary unit.

As you may be aware, at the time the voluntary unit was implemented to effect certain savings that will come with unitization, we encountered opposition from a royalty interest owner, Floos, Inc., Mohammed Merchant. The order that resulted at that time provided that only the working interests would be unitized.

We're coming here today seeking statutory unitization to combine all interests in the unit area for the implementation of waterflood operations.

As you are also aware, there have been several communications from Floos, Inc., again expressing concern about the project. And I can tell you today that we have reached an agreement with Mr. Merchant, and we will be offering a letter as part of our case whereby he withdraws his objection.

We have talked with other royalty interest owners in the area, and we believe at this time the effort to

unitize is unopposed.

When you look at this case you'll see that in the unit area there have been, and for some time, three wells that have been used for disposal to -- are now active disposal wells. And as a result of the disposal of water in the Devonian formation, there has been certain water and pressure support in the unit area for some time.

We'll present you today our study, a study which has been conducted in the last year, which shows that the reservoir is actually broken into three compartments or regimes within the unit area, and each of these compartments will benefit substantially from waterflood operations.

We'll show you how we intend to change the way we are injecting in the existing wells, redirecting water into the particular new pay zones, and we will also present a C-108 in which we seek authority to add one additional injection well.

When we make these changes, we believe we can show you that we will substantially increase the recovery from the unit area.

I have three witnesses who need to be sworn.

EXAMINER CATANACH: Will the witnesses please stand to be sworn in?

(Thereupon, the witnesses were sworn.)

LORIN J. RULLA,

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

DIRECT EXAMINATION

BY MR. CARR:

Q. Would you state your name for the record, please?

A. My name is Lorin John Rulla.

Q. Where do you reside?

A. Midland, Texas.

Q. By whom are you employed?

A. Saga Petroleum.

Q. And what is your position with Saga Petroleum?

A. I'm a petroleum geologist.

Q. Have you previously testified before the Oil Conservation Division?

A. Yes, I have.

Q. At the time of that testimony, were your credentials as an expert in petroleum geology accepted and made a matter of record?

A. Yes, they were.

Q. Are you familiar with the Applications filed in each of these cases?

A. Yes, I am.

Q. Mr. Rulla, are you familiar with the status of the lands involved in the Crossroads-Siluro-Devonian Unit

Area?

A. Yes, I am.

Q. And are you familiar with the efforts of Saga to reach voluntary agreement with other interest owners in the unit area for the development of these lands?

A. Yes, sir.

Q. Are you familiar with the proposed unit agreement, the proposed operating agreement, and the status of ratifications of the proposed unit plan?

A. Yes, sir.

Q. In addition to that, have you made a geological study of the unit area?

A. Yes, I have.

Q. And are you prepared to share the results of your work with Mr. Catanach?

A. Yes, sir.

MR. CARR: We tender Mr. Rulla as an expert witness in petroleum geology.

EXAMINER CATANACH: He is so qualified.

Q. (By Mr. Carr) Initially, would you state what it is Saga seeks in these cases?

A. Statutory unitization of the Crossroads-Siluro-Devonian Unit Area comprised of 800 acres, more or less, of fee lands, approval of a waterflood project for the unit.

Q. And what is the current status of the acreage in

the unit area?

A. The unit consists of three tracts.

Q. Are they all fee lands?

A. Yes.

Q. And this acreage was voluntarily unitized?

A. Yes, it was unitized by Order Number 12,133, entered July 6th, 1999, approved voluntary unitization of this acreage.

Q. At that time, only the working interest was unitized; is that correct?

A. That's correct.

Q. And how has royalty been paid?

A. It's been paid on a lease basis.

Q. Why does Saga now seek to statutorily unitize the area?

A. Because the wells in the area produce huge quantities of water, and we currently have two active disposal wells in the area and another currently temporarily abandoned, which we intend to return as an injector.

Q. Are you also seeking authority to add one additional injection well as part of the waterflood or pressure maintenance effort in the Devonian formation?

A. Yes, sir.

Q. Could you refer to what has been marked for

identification as Saga Exhibit Number 1, identify it and review it for Mr. Catanach?

A. This is a map of the unit tracts. It shows the Texaco tract in the south half -- or the east half of Section 34, as being Number 1. The Santa Fe tract is Number 2, in the northwest quarter of Section 27, and the U.D. Sawyer tract in the east half of Section 27 as being Tract 3.

Q. It also shows the wells in the unit area, does it not?

A. Yes, it does.

Q. And there is a code which explains the well symbols in the lower left-hand portion of the exhibit?

A. That's correct.

Q. What is Exhibit Number 2?

A. It's a unit agreement.

Q. Exhibit Number 2. Is Exhibit Number 2 the ownership schedules?

A. Yes.

Q. And these are the same as Exhibit B to the unit agreement; is that correct?

A. Yes.

Q. Do these show the ownership broken down by each of the three tracts in the unit area?

A. Yes, it does.

Q. And it shows the working interests, royalty interests and overriding royalty interests by tract; is that correct?

A. That's correct.

Q. All right. Now, let's go to Exhibit Number 3. That's the unit agreement, correct?

A. Correct.

Q. Basically, could you just describe Exhibit 3 for us?

A. It's a typical form based on the state waterflood form. It shows the character of the lands, provides for waterflooding and sets out the basis for participation of each of the parties.

Q. And what is the tract participation formula as set forth in this exhibit?

A. It's based on 45-percent reserves and 55-percent production.

Q. And what is Saga Exhibit Number 4?

A. It's the unit operating agreement.

Q. And can you just summarize briefly what the key provisions are in this operating agreement?

A. It outlines supervision and management of the unit, defines the rights and duties of all the parties, shows how investments and costs are to be shared, establishes voting procedures for decisions to be made by

the working interest owners. This is equal to each working interest owner's participation in the unit. It sets forth accounting procedures, show how costs will be allocated and paid, contains other standard provisions.

Q. Mr. Rulla, is Exhibit Number 3 [*sic*] a table which shows unit participation by tract?

A. Yes, sir.

Q. And if we would take the participation, the allocated working interest participation, from this exhibit, we could then, by using Exhibit Number 2 where everyone's ownership percentage is set up by tract, we could determine the exact ownership in the unit of every interest owner, working interest, royalty interest, overrides; is that correct?

A. Yes, sir.

Q. What percent of the working interest ownership is presently committed to the unit?

A. A hundred percent.

Q. And Saga Exhibit Number 2 also shows the override and royalty interests, correct?

A. Yes, it does.

Q. And what percentage of the royalty interest at this time is committed to the unit plan?

A. Eighty-five percent.

Q. And that includes the interest of Floos, Inc.,

does it not?

A. Yes, it does.

Q. Do you anticipate any difficulty in obtaining ratification of the order that results from this hearing by the necessary 75-percent working interest or non-cost-bearing interest owners?

A. No, sir.

Q. Now, you are familiar with the objections that were raised by Floos, Inc., are you not?

A. Yes.

Q. You've seen the letters that were sent to the Commission and Division concerning the participation formulas set forth in the unit, correct?

A. Yes.

Q. What is the status of the negotiations at this time with Floos?

A. We've reached an agreement.

Q. And is Saga Exhibit Number 6 a copy of the letter from Floos withdrawing the objection to the proposed unit?

A. Yes, sir.

Q. Do you believe Saga has done all that reasonably can be done to obtain voluntary commitment of all interests to the unit plan?

A. Yes, sir.

Q. And that includes working, royalty and overrides,

correct?

A. Yes.

Q. Is Exhibit Number 7 an affidavit confirming that notice of this hearing has been provided in accordance with Division rules?

A. Yes.

Q. To whom was notice provided?

A. All the interest owners subject to a statutory unitization order, all the leasehold operators and surface owners within the areas of review for any new injection well with a copy of completed Form C-108, all owners within a half a mile of the unit boundary.

Q. Let's now go to the geological portion of this case, and I'd ask you to first identify what has been marked Saga Exhibit 8.

A. That's a copy of the proposed statutory water injection unit.

Q. Is that the study that you prepared --

A. Yes, It is.

Q. -- as part of this plan?

A. Yes, it is.

Q. And you prepared the geological portion of this study?

A. Yes, I did.

Q. And who prepared the engineering portion?

A. Robert Setzler, an engineer with Saga.

Q. And will Mr. Setzler also be testifying about the information contained in the study?

A. Yes, he will.

Q. Generally, what does this study show?

A. It shows that the Crossroads-Siluro-Devonian Unit looks like it can be subdivided into three separate porosity regimes, that water has been disposed into this unit for some time, and that by redirecting the water we can maintain an increased reservoir pressure and efficiently sweep reserves to producing wells in each of the three specific Devonian zones.

Q. If we look at your study, the first portion of the study is a text that explains the exhibits which start on about page 7 or 8 of the study; is that correct?

A. Yes.

Q. Let's go to what has been marked as Saga Exhibit Number 1.

A. Okay.

Q. And here we're looking at the exhibits to the study, so again we're going to have some overlapping numbers, and I'll clarify that when we move admission of the exhibits. But this is Study Exhibit Number 1. What is that?

A. That shows the proposed unit outline. It also

has a code at the bottom that shows the current status of each of the wells within and outside the unit. And it's identical to the first -- to Exhibit A, map of the unit tracts.

Q. And also to Exhibit 1 that was presented earlier; is that correct?

A. Yes.

Q. Okay, let's move to Exhibit Number 2. Can you identify and review this?

A. Exhibit Number 2 is a structure map on the top of the Devonian porosity. The gray lines are fault traces that occur within the Devonian, and we hope to show distinctive separation between each of those areas as a result of the faulting, and also the deposition that occurred beneath the major unconformity that occurred at the base of the Woodford, and also the porosity will be shown to vary from location to location over the Crossroads field. And in this study we discovered that we have a possible new pay zone in the area.

The area is bounded on the west by a controlling fault that controls the production, and all of the wells on the north and east have been abandoned.

Q. When we look at the wells on the north and the east, they're actually downstructure, are they not?

A. Yes, they are.

Q. And they are --

A. They're all water wet.

Q. Okay. And the southern boundary is basically -- There is no reservoir beyond the southern boundary of the proposed unit?

A. No, the Well Number 4 and the Texaco tract was a dry hole in the Devonian.

Q. Okay. Let's go now to Study Exhibit Number 3. Will you identify and review this exhibit for Mr. Catanach?

A. This is a map made on the top of the Devonian porosity, depth to the top of the Devonian porosity, which it measures down from the base of the Woodford to the occurrence of the first porosity in the Devonian. And coupled with the faults you can begin to see that the center portion, which was probably the highest portion in the field, the pay was eroded off, and we have additional pay shown on the north and south, occurring very close to the top of the Devonian, while the center portion, you have to go down about 50 to 60 feet before you encounter porosity.

And this resulted in what we call the new pay occurring on the north side of Section 27, and I'll elaborate more on that with the other maps.

Q. And this map also indicates the location of the injection wells --

A. Yes.

Q. -- in each of the regimes in the unit area?

A. It shows the disposal wells, Well Number 11 and Well Number 6 in Section 27, and Well Number 4 in Section 34.

Q. Let's go now to Exhibit Number 4 and review that for the Examiner.

A. Exhibit Number 4 is a map of a net porosity in the upper Devonian, or the new pay, as we call it, versus the main pay, which is beneath it, and it shows that the new pay occurs mostly in the north half of Section 27 and is also present in Section 34, and it's practically gone in the center portion of the field where the faults have caused it to be eroded off.

Q. When you implement the full waterflood in the area, you're going to be flooding the old section as well as the new pay; isn't that correct?

A. That's correct, yes.

Q. Let's go to Exhibit Number 5. Would you just identify that for Mr. Catanach?

A. That is the index to the cross-section that I'm going to show you.

Q. Let's keep that out and go to Exhibit Number 6, your east-west cross-section A-A'. Will you review the information set forth on this exhibit?

A. It shows the location of the new pay with regard to the main pay, and it shows that most of the wells were completed in the main pay in this area.

It shows the type log for the waterflood, Well Number 11 on the cross-section, and it shows that the new pay has not been perforated in a good number of the wells in the north part of the regime, and that we hope to go in there and perforate that and waterflood it.

Q. Let's go now to cross-section B-B', your north-south cross-section.

A. The north-south cross-section shows that wells north of the unit area were all completed in the new pay, and most of them didn't penetrate the main pay, because they didn't have to, and because it would have been below the oil-water contact.

And two of the wells have not been perforated in that pay. These two wells are on Saga acreage.

It shows the current water disposal wells, Well Number 11 and Number 6, and it shows where we crossed the fault and go back into the new pay, which occurs right at the base of the Woodford, and the abandoned Devonian producer, Well Number 4 at the right end of the section.

Q. If we look at the two wells on the north end of the cross-section, those are outside the unit area. Are those wells structurally low and wet?

A. Yes, they are. The single well is.

Q. All right, let's go to cross-section C-C'

A. C-C' is an east-west section showing the first well that defined the new pay in the area, and it was completed in 1949 and has produced 1.4 million barrels of oil.

It also shows the new pay areas that will be attempted to be perforated and the proposed future water injection well, Well Number 4, on the right-hand side of the section. It was originally completed open hole in 1952 and then plugged back and completed in the new pay in 1974 and potentialed for 593 barrels of oil and 1173 barrels of water a day.

And we intend to complete this as an injector in both the new pay and the old -- and the main pay.

Q. Let's go now to Saga Exhibit Number 9. Would you identify the exhibit for Mr. Catanach and the review the information set forth thereon?

A. Number 9 shows the unit outline, and it shows the current proposed recompletions of the three wells on the north unit, with squares which show the recompletions into the new pay. It shows the proposed water injection well in the northeast corner of Section 27. It shows the proposed Injection Well Number 4 at the south end of Section 34.

It shows the two current water disposal wells,

Number 11 and Number 6. And it shows the current status of each of the wells in the area as to where they were completed, whether in the main pay or in the new pay.

Q. With this information, this much well data, it's fair to say that the area to be unitized has been reasonably developed -- or defined by development; isn't that correct?

A. Yes, sir.

Q. Can the portion of the pool which is included in this proposed unit area, in your opinion, be efficiently and effectively operated under a unit plan of development?

A. Yes, it can.

Q. And the boundaries of the unit are well established?

A. That's correct.

Q. You have a fault on the west?

A. That's correct.

Q. No reservoir on the south?

A. That's correct.

Q. And you're downstructure and wet, both to the east and the north?

A. That's correct.

Q. In your opinion, do each of the compartments or regimes within the unit area have good waterflood potential?

A. Yes, sir, they do.

Q. Were Exhibits 1 through 7, and then in the study Exhibits 1 through 8, prepared by you or compiled under your direction?

A. Yes, they were.

MR. CARR: At this time, Mr. Catanach, we would move admission into evidence of Saga Exhibits 1 through 7, and also Study Exhibits 1 through 8.

EXAMINER CATANACH: Exhibits 1 through 7 and Study Exhibits 1 through 8 will be admitted as evidence.

MR. CARR: And that concludes my direct examination of Mr. Rulla.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Rulla, this field has been around a long time; is that correct?

A. Yes, it has.

Q. When was it first developed, do you know?

A. 1947.

Q. And as far as the areal extent, is this field much larger than you've shown it here, or was it at one time?

A. Yes, it was a very large field. All of the wells that you see on these maps, with the addition of some more that are beyond the limits, were part of the Crossroads-

Siluro-Devonian field. But all of the wells surrounding this unit area are now abandoned. They were abandoned because they made too much water.

Q. So your waterflood unit here is located at the structural high position with --

A. Yes, it is.

Q. Okay. There's not been very many of these wells that have been completed in what you're calling the new pay; is that right?

A. That's correct.

Q. Just what? Three?

A. Three.

Q. And according to your exhibit there is considerable potential, especially in Section 34, for that pay to be present?

A. Yes.

Q. Is it prudent to produce that new pay under waterflood operations instead of under primary operations at this point?

A. We think so. Mr. Setzler -- We have some additional information, because this whole area is making a lot of water right now, and we're also proposing some remedial operations in here.

Q. Well, do you know why that pay in these wells was never tested or perforated?

A. It was tight. It's not as prominent or as porous as the wells that currently produce.

Q. Now, when you say it's compartmentalized, there's separate producing compartments. Are these what you've shown to be isolated by faults; is that correct?

A. Yes, uh-huh, isolated -- The north portion is isolated from the center portion because of an updip pinchout of porosity. And the south portion is separated from the center portion by the fault, structurally as well as stratigraphically.

Q. And it's your opinion that these are effectively isolated from one another?

A. Yes, sir.

Q. So in your waterflood project you'll have to treat these almost like three different projects?

A. Yes.

Q. Are the pay intervals pretty consistent within each of these compartments?

A. No, they're not. They vary a lot in the amount and thickness of porosity.

Q. Are they consistent enough to where effective waterflooding can occur in these areas?

A. They're in the same stratigraphic position essentially, so that you would be flooding the same zone. The variations occur in the amount and the thickness of

porosity.

Q. So you should get response from water injection within all the producing wells?

A. Yes.

Q. And is somebody else going to talk about how many wells you're going to have and that kind of thing?

A. Yes.

Q. Okay. Which parties are you actually unitizing with this Application, or seeking to unitize? Can you identify those for me?

MR. CARR: Mr. Examiner, I think they're identified in Exhibit A to the notice affidavit. There are a number of royalty interest owners.

EXAMINER CATANACH: Exhibit A to the notice? This unit, if I understand correctly, was initially unitized a year ago, voluntarily?

MR. CARR: That's correct.

EXAMINER CATANACH: Just the working interest?

MR. CARR: Correct. We had objections from Mr. Merchant to the unitization, and it was set forth in the order, because of his objection, that the working interest was unitized but the royalty payments would continue to be made on an individual lease basis or tract basis.

Q. (By Examiner Catanach) Since that time, have there been further discussions with these interest owners

to try and get them to voluntarily participate in the unit?

A. Yes, sir.

Q. And the status of the interest owners on Exhibit A here, do you believe any more are going to voluntarily commit to the unit?

A. I can't answer that right now.

MR. CARR: Mr. Catanach, I've been involved more in that than Mr. Rulla. We think there's a chance a closing will commit.

We have also been engaged in recent negotiations with Candace Jacobson, and we think there's a good likelihood that she could commit her interest in two of the tracts. Beyond that, we don't think that we're going to be able to get any farther.

EXAMINER CATANACH: When did this negotiation process start, Mr. Carr?

MR. CARR: My involvement in the negotiations has been for the last probably -- since April of this year. And they were ongoing prior to that time. I couldn't give you a start date. My most recent conversations concerning the interests of Candace Jacobson were on Tuesday of this week with her attorney Doug Lunsford with the Hinkle firm.

Q. (By Examiner Catanach) Well, who with Saga has been involved in contacting these people, Mr. Rulla?

A. Our president, Chuck Farmer.

Q. And he is not here today?

MR. CARR: No, he's not.

Q. (By Examiner Catanach) Well, do you have some knowledge about when these negotiations took place or when they started?

A. They started about two years ago, I believe.

Q. And Floos has waived objection?

MR. CARR: Yes, sir, they have.

EXAMINER CATANACH: To what?

MR. CARR: They have withdrawn their objection to the unit. There have been meetings within the last two weeks with Mr. Merchant, and the participation formula was explained to him, and the result was the letter which is in, I believe, as Exhibit 7, that he directed to me.

Q. (By Examiner Catanach) Okay. On Exhibit Number 2, that sets for the interest owners in the unit, and I assume that the far right column sets forth their participation in the entire unit; is that correct?

A. Yes. Each of the unit tracts has its own participation.

Q. For instance, Tract Number 1 is allocated 37.7 percent of the unit?

A. Yes.

Q. Now, how were the tract participations determined? Do you have something that shows that? I

assume that's based on the tract participation formula contained in the unit agreement.

MR. CARR: That is correct, it was tract by tract, 45 percent reserves, 55 percent cum production.

EXAMINER CATANACH: Do you have any evidence that shows those numbers, that -- what numbers were utilized to come up with those percentages?

MR. CARR: The 45/55 were agreed-to numbers.

EXAMINER CATANACH: No, not the percentages, but the actual --

MR. CARR: The calculations?

EXAMINER CATANACH: Yes, sir.

MR. CARR: To get to the -- We do not have those with us. We could supply those. I mean, they're --

EXAMINER CATANACH: Okay, I would appreciate it if you would supply those. It's strictly past production and --

MR. CARR: -- and remaining reserves, calculated.

EXAMINER CATANACH: -- remaining reserves.

MR. CARR: We can give you the base numbers, the actual numbers, and show the calculation, it's easy. We have that, we just don't have it with us.

EXAMINER CATANACH: Okay. I think that's all I have of this witness.

MR. CARR: Mr. Catanach, at this time we call

Robert Setzler.

ROBERT G. SETZLER,

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

DIRECT EXAMINATION

BY MR. CARR:

Q. Would you state your name for the record, please?

A. My name is Robert Gaston Setzler.

Q. Spell your last name, please.

A. S-e-t-z-l-e-r.

Q. Where do you reside?

A. In Midland, Texas.

Q. By whom are you employed?

A. Saga.

Q. And what is your position with Saga

A. I am an engineer.

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

A. Yes, sir.

Q. Are you familiar with the Applications filed in these cases?

A. Yes, sir.

Q. Have you made an engineering study of the area which is involved in the case?

A. Yes, sir.

Q. And are you prepared to share the results of your work with the Examiner?

A. Yes, sir.

MR. CARR: We tender Mr. Setzler as an expert witness in petroleum engineering.

EXAMINER CATANACH: He is so qualified.

Q. (By Mr. Carr) Mr. Setzler, are you familiar with the Statutory Unitization Act?

A. Yes, sir.

Q. And have you prepared exhibits for presentation in this case?

A. Yes, I have.

Q. Could you refer to Exhibit Number 10 to the study?

A. Yes, sir.

Q. Identify that for Mr. Catanach and review the information on this exhibit.

A. Okay. Exhibit 10 is a production plot --

EXAMINER CATANACH: I don't think I have Exhibit Number 10.

THE WITNESS: I'll be happy to let you see mine.

MR. CARR: It should be right there.

EXAMINER CATANACH: Oh. Gee, thanks.

THE WITNESS: All right, sir. This is just a

typical production plot of a well that exists in the Crossroads Devonian field, but the reason I chose to show you this plot is, it is an example of what we hope to accomplish in reworking these wells.

It was treated with a polymer squeeze, with a retainer set into its perforations. It is perforated in a 50-foot interval. The bottom 40 feet of the perfs were treated with polymer, the top 10 feet were kept open by pumping water in at the same time we were pumping polymer.

And as a result, we, on this particular well, went from 11 barrels of oil a day and 1100 water to 7 barrels of oil a day and 200 water.

It tells us that we are now producing oil out of a much tighter rock that we -- And that's also witnessed by the fact that fluid levels prior to the work being done, working fluid level was about 2100 feet from surface, and after, following the work, the working fluid level dropped to a little -- 6100 feet from the surface, for a total drop of 4050 feet, which means that we have effectively cut off a lot of the bottom water that is not really doing us any good.

Now, our plan is to -- by injecting into offset wells, we will put pressure back into the tighter zone and be able to sweep oil out of the tighter zones, getting more oil out of them, probably oil that would never be recovered

under current operations.

Q. (By Mr. Carr) Okay, Mr. Setzler, let's now go to Saga Exhibit Number 11. Identify what this exhibit shows, and then review the information on the exhibit for Mr. Catanach.

A. All right, sir. Eleven is just kind of a summary sheet of all the information we gathered, or I gathered, on this field. It tells formation and when the field was discovered, et cetera, depth and that sort of thing.

Also gives reservoir volumetrics, gives the area of the total field and Saga's portion of the main pay and Saga's -- the acreage in the -- what we've identified as new pay. It's broken down into acre feet per each portion, as you can see there, and the gross thickness and average net thicknesses.

Item 3 on this summary gives the breakdown of production as to what's been produced to date and what is remaining. The total field to date has produced 48.1 million barrels of oil. Saga's portion of that is 21 million 771 million [*sic*] barrels of oil. And the new pay that we've identified will recover an additional 1.8 million barrels of oil.

By doing this work, the proposed work, we will gather an additional 844,000 barrels of oil from the main pay and 517,000 barrels of oil from the new pay.

We will realize, as shown in item 4, a total recovery of 23,615,000 barrels of oil at the end of the project. We have remaining to the proposed work another 1,361,000 barrels of oil, which will be -- the 1.3 million will be recovered over the next 50 years of operation out there.

Original bottomhole pressure was 4885 pounds and has now dropped to approximately 4300 pounds, and that also points to us that we need to put water back into these upper zones to maintain pressure and be able to recover the reserves that are there in an economical fashion.

The rest of the page just gives parameters of porosity, perm, that sort of thing.

Q. Mr. Setzler, what is Exhibit 12?

A. Exhibit 12 is a plot of percent water cut plus cum oil. It's a way that people use with water drive formations to project ultimate recoveries or to give a reasonable estimate of what the ultimate recovery in the field would be.

And this curve, when projected to 97-percent water cut, shows that the main pay portion of the field that's under our leases will recover 21,771,000 barrels of oil, which is shown in item 3 on your main pay portion of Saga, bottom EUR. All right, sir?

Q. When you talk about Saga leases, are you talking

about the three tracts which comprise the unit area?

A. Yes, sir, I am.

Q. Let's go now to Exhibit Number 13. Could you identify that, please?

A. Yes, sir, I'd be happy to. Exhibit 13 is taken from actual field data. It's a plot of -- since the field was developed in 1947, of cum oil versus cum barrels fluid produced. This plot was used to project future production in this field.

And what I did was, I related this recovery that is shown by this graph, I curve-fitted it with a polynomial, a fifth-order polynomial, and reduced it to recovery per acre-feet and then expanded it back to acre-feet that we identified in the new pay zone, and was able to get what I feel is a reasonable projection of oil recovery from the new pay zone, and by extrapolating this on out, get a reasonable recovery of what's remaining in the main pay zone, which was used to develop the data that's in Exhibit 11.

Q. Are you ready to go to Exhibit 14?

A. Yes, sir.

Q. Okay, what does this show us?

A. Exhibit 14 shows the field as it is now. And if we don't do anything, if this work is not done, based on the projections I've just discussed, we would follow the

black curve shown, the extension of the green curve. And we would recover about 850,000 barrels of oil that way.

By combining the projection of the new pay with the existing pay, you get the curve shown on Exhibit 15, which shows that we should recover another 550,000 barrels through proper maintenance and flooding of the new pay zone.

Q. And is this 550,000 barrels production that would be wasted or lost without the implementation of the proposed waterflood effort?

A. That's correct, sir.

Q. In your opinion, are the unitized methods of operation as applied to the area covered by this Application feasible?

A. Yes, sir.

Q. Do you believe that unitization and -- it is necessary to reasonably and effectively carry on secondary recovery operations?

A. Yes, I do.

Q. Does Saga have plans to commit additional wells to injection in the future?

A. Yes, sir, at least one.

Q. And do you request, to the extent possible, authorization to add additional wells by filing Form C-108 with the Division, without the necessity of hearing?

A. Yes, sir, we do, or I do.

Q. Now, if we look at Exhibit 8, the study, Mr. Rulla prepared the first portion of that study; is that correct?

A. That's correct.

Q. You prepared Exhibits 10 through 15?

A. That's correct, sir.

Q. You collaborated on the text which precedes the exhibits; is that correct?

A. That's correct, sir.

MR. CARR: Mr. Catanach, at this time I would move the admission -- I think it's easier just to move the admission of Exhibit 8, all parts.

EXAMINER CATANACH: Sorry, Exhibit 8?

MR. CARR: Eight. That's the study, text and all exhibits.

EXAMINER CATANACH: Exhibit 8 will be admitted as evidence.

MR. CARR: And that concludes my direct examination of this witness.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Setzler, the polymer squeeze that you guys are going to do, is that going to be done on all of the wells completed in the main pay zone?

A. Yes, sir, as -- It will be done on a well-by-well basis, but as we see the need, yes, it will be done, the same way as we have already done -- I guess that is now Unit Well 30 -- let me get back to my -- I'm sorry. Well, it was Sawyer Number 3. That was the -- in Tract 3.

That work has been done, and will be done on other wells, having new pay and main pay, because we know as we get closer to the top of the Devonian the pay gets tighter, and we need to shut off part of the fluid movement back into the more permeable area so that we can force water through the tighter zones.

Q. So the polymer effectively reduces the permeability of that lower section?

A. Yes, sir.

Q. Is that on a permanent basis?

A. We can remove it if we have to, but it is meant to be on a permanent basis.

Q. Okay. Now, if I understand your -- Let me just go over your reserves that you hope to recover.

A. Uh-huh.

Q. From the new pay --

A. Yes, sir.

Q. -- you hope to recover 517,000 barrels of oil?

A. Yes, sir.

Q. That's within the whole unit?

A. Yes, sir.

Q. And from the main pay an additional 844,000 barrels?

A. That's correct.

Q. Okay. Now, the Exhibit Number 12 --

A. Yes, sir.

Q. -- is used to calculate remaining recoverable reserves in the main pay?

A. Yes, sir.

Q. And that's just based on --

A. -- water cut versus cum oil.

Q. Okay. So this really doesn't take into effect additional injection operations, does it?

A. No, sir. What I did is, I -- Using this curve, I calculated how many barrels ultimate I thought we could recover from main pay, which calculated out 21,770,000, and knowing that, I -- and combined with the Exhibit 13, the characteristic of that equation or of that curve, we were also going to a 97-percent water cut.

We took the acre-feet, or I took the acre-feet in the new pay and related the performance of this curve, expanded back to the number of acre-feet in the new pay, to project how many barrels and how it would be produced, not just the total barrels.

Eleven was used -- I mean 12 was used just to

give total barrels in the main pay. And the actual projection was developed from Exhibit 13. In both cases I assumed I could go to a 97-percent water cut.

Q. Okay. So this is the oil that you hope to recover simply by doing some polymer squeezes in existing wells and opening up some pay in some wells?

A. Yes, sir.

Q. This really doesn't take into account any additional reserves you might recover from water injection; is that right?

A. Well, in the new pay, we're not producing from it now, so when we perforate it and we open up that interval in the injection well, we will be sweeping oil that we couldn't recover otherwise.

Q. I'm sorry, can you run that by me again?

A. Okay, we are not at the current time producing oil in the northern fault block from the main pay, and we can move additional oil out of that main pay -- I mean out of the new pay, excuse me.

And by perforating the new pay in the producing wells up there and by opening up the new pay in the injection well up there, we'll be able to sweep reserves out of that. And we're going to be able to do -- recover reserves that couldn't be recovered otherwise.

Q. So do you feel that in order to recover the

517,000 barrels from the new pay, that you feel like water injection is a part of that?

A. Yes, sir.

Q. You definitely need that, to recover that 517,000?

A. Yes, sir, because since this field was first drilled in 1947 to current, we know that we've had about a 580-pound bottomhole pressure drop, and as your pressure drops, you are not nearly as liable to -- or it's not near as easy to recover reserves from the rock. You need to have your pressure up to where it was or even higher.

Q. So the pressure in the new pay zone, even though it hasn't been produced in some areas, has still dropped that much?

A. Yes, sir, I feel that it has. It's in connection to the aquifers.

Q. Okay. And does that hold true for the other -- for the main pay section as well?

A. Yes, sir.

Q. You would need that injection operation to recover the 844,000?

A. Yes, sir. As we stop a lot of the water going down, where it's not doing any work, and put it back into the area where we need it to do work, we will sweep additional reserves out of the main pay as well as the new

pay.

Q. Okay. Up to this point you've been -- Have you been injecting into that portion of the reservoir, the main pay?

A. Yes, sir, but down below the water contact primarily.

Q. In all three of the wells?

A. Yes, sir.

Q. So you intend to do the polymer squeeze on the injection wells, I assume?

A. Yes, sir.

Q. And so you can get the water up into the section you want it to go?

A. That's correct.

Q. Okay. And let's see, where is the third injection well?

I show one in the northeast-northeast of 27 and then one down in Section 34. Where's the other one?

A. Back to the -- are you -- in this exhibit here?

Q. Yes.

A. You have a saltwater disposal, Number 6, down in the lower portion of Section 27, and directly --

Q. Okay.

A. -- north of it you have 11, and then north of that you have 4. It has a big triangle around it.

Q. Okay.

A. And then to the south you have one.

Q. Now, the plan is to use those current wells and possibly an additional well?

A. Yes, sir.

Q. Where would the additional well be located?

A. Well, right now the additional well would be the one up in the corner of 27. It is not an active injection well right now.

Q. Okay, so you initially plan to use three --

A. Three wells.

Q. -- and that's all?

A. No, we're going to convert that one up there in that corner, as soon as the unit -- shortly after the unit becoming totally effective.

Q. Okay, so that's three?

A. That would be four. Yeah, one, two, three, four.

Q. Okay. The 11, I got it.

A. Okay, yes, sir.

Q. Sorry about that.

A. No problem.

Q. It's been a long day. Okay, so you're going to use four wells?

A. Four wells initially, and if we see extremely good response to what we're doing, then we will probably

choose more wells to put on injection.

But that's something that will develop as the project develops.

Q. Now, will that -- will using those four wells -- will you have an injection well in each of the three compartments?

A. Yes, sir.

Q. Okay.

A. Yes, sir. And we'll be able to affect the main pay and new pay in each of the compartments.

Q. And do you think that having one injection well in each of those compartments will be sufficient to do what you plan to do?

A. I hope so. And as I said, if we see good response to that, then we would be recommending more in the future. But it's...

Q. And you're estimating a 50-year project life?

A. Yes, sir.

Q. Do you know what these wells are currently producing?

A. Yes, sir, the total on the field right now is 110 barrels of oil a day and approximately 3000 barrels of water.

Q. And when you say "field", you're just talking about the unit area?

A. Yes, sir. That's the only place we have -- I'm sorry, that's where the producing wells are right now. They're in the unit.

Q. And how many producing wells will you utilize in the unit?

A. All that are shown on this map.

Q. You better count them for me, because I can't count.

A. Okay, I'll count them. Seven wells, I believe, is that -- Five wells. We have --

Q. Five producing wells?

A. Uh-huh.

Q. Within the whole unit?

A. Uh-huh.

Q. Now, would those -- Looking at this exhibit, would those be the wells with the green circle, innermost circle?

A. It should be.

Q. Okay, I count six.

A. I count six too, I apologize. I count six.

Q. Are there any plans to bring on additional producing wells?

A. Yes, sir, that will all go with the project. As we see response, we'll be looking at reworking wells and perforating them and most certainly recommending one or two

more injection wells to go with that.

Q. Now, the remainder of these wells, are they plugged or are they temporarily abandoned?

A. They're temporarily abandoned.

Q. They are TA'd, okay.

A. Yes, sir.

Q. Do you know in what manner they're TA'd? Do they have bridge plugs in the hole?

A. Many of them have bridge plugs.

EXAMINER CATANACH: I have nothing further of this witness.

MR. CARR: At this time, Mr. Catanach, we would call Joe Clement.

JOE N. CLEMENT,

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

DIRECT EXAMINATION

BY MR. CARR:

Q. Could you state your full name for the record?

A. Joe Neal Clement.

Q. Mr. Clement, where do you reside?

A. Midland, Texas.

Q. By whom are you employed?

A. Saga Petroleum.

Q. And what is your position with Saga Petroleum?

A. I'm area engineer.

Q. Have you previously testified before the Oil Conservation Division?

A. Yes, I have.

Q. At the time of that testimony, were your credentials as an expert in petroleum engineering accepted and made a matter of record?

A. Yes, they were.

Q. Are you familiar with the Applications filed by Saga in each of these cases?

A. Yes.

Q. Are you the individual who prepared the Application for the permit to inject in one additional well in this case?

A. Yes, I am.

Q. And are you prepared to present that and other information concerning the proposed project to the Examiner?

A. Yes.

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

EXAMINER CATANACH: They are.

Q. (By Mr. Carr) Initially, Mr. Clement, are you the individual who would be responsible for preparing the backup calculations concerning tract participations and

unit participations?

A. Yes, I am.

Q. And you will submit to the Examiner the backup information that you utilized in setting those numbers?

A. Yes, I will.

Q. By using the parameters, 45 percent reserves and 55 percent production, do you believe that each interest owner in the unit will receive their fair share of the additional unit production which will be recovered as a result of the waterflood project?

A. Yes, I do.

Q. And in your opinion, do you believe these numbers and the data you will submit will show that unitization will benefit all working interest owners and all royalty interest owners in the unit area?

A. Yes, I do.

Q. Let's go to what has been marked Exhibit 9, a copy of the Form C-108 for the additional injection well. Initially, is this an expansion of an existing project?

A. Well, we're seeking to utilize three previously approved disposal wells and add one new injection well.

Q. Could you give Mr. Catanach the numbers for the orders that approve three previous injection wells?

A. The U.D. Sawyer Number 6 was approved under SWD-690, U.D. Sawyer 11 was approved under SWD-662, and the

Texaco Sawyer Number 4 was approved under R-3613.

Q. Which of these wells are currently being used for disposal?

A. The Number 6 and the Number 11.

Q. And the Texaco Sawyer is the well you hope to return to injection?

A. Yes.

Q. Is the project area the same as the unit boundary?

A. Yes, it is. Ownership was reviewed by the land, and the wells are shown on Exhibit 9.

Q. If we look at the Exhibit Number 9, the C-108, could you go to page 3 of that, identify the location for the new well, and review the information on that page.

It's not a very good Xerox copy, but -- at least the one I have. You might give the exact location for the well.

A. It's U.D. Sawyer Number 4, Unit Letter A, 660 from the north, 660 from the east, Section 27, Township 9 South, Range 36 East.

Q. And this plat is designed to show wells within a two-mile area; is that correct?

A. Yes, it shows ownership of all the offset leases, and it shows the area of review covered by the C-108.

Q. What is the present status of the well you hope

to use for injection?

A. It is currently TA'd. It was a producer in the Penn.

Q. Do pages 4 and 5 of Exhibit 9 in a tabular form set forth the data on the wells within the area of review which are required by Oil Conservation Division Form C-108?

A. Yes, it shows wells, spud dates, locations, all casing strings, tops of cement, cement volumes and completions.

Q. And are pages 6 through 18 of this exhibit schematic drawings of all plugged and abandoned wells within the areas of review, summarizing all the plugging details?

A. Yes.

Q. Have you a well data sheet for each of the wells within the area of review?

A. Yes, I do.

Q. Could we go to the schematic for the proposed injection well, which is page 2 of this exhibit, and I'd ask you to refer to that and review for Mr. Catanach your proposal for the well.

A. This well will be re-entered, the Penn zone will be squeezed off, cement-squeezed, drilled out, run in hole with Baker Lok-Set packer with 2-3/8 plastic-lined tubing, set the packer at 12,035 feet, circulate the hole with

packer fluid, pressure test the casing annulus in accordance with state and federal laws.

Q. And you will have a gauge at the surface to monitor the pressure in the annular space?

A. Yes.

Q. Into what formation are you proposing to inject?

A. We propose to inject into the Devonian.

Q. And what is the depth of the Devonian sands we're going to be injecting into?

A. Across the unit they run from 11,948 to 12,178. This particular well we propose injecting into the interval 12,085 to 12,100.

Q. The net thickness varies across the unit. Do you have the numbers for the variation in thickness?

A. It varies anywhere from 15 feet to 75 feet.

Q. And what is the average porosity?

A. Average porosity is 13.4 percent, and permeability is approximately 50 millidarcies.

Q. Are there other oil-productive zones in the immediate area?

A. No.

Q. And what is the source of the water that will be injected?

A. It will be produced water from our lease and, if necessary, other leases of other Devonian producers.

Q. There is an adequate supply of water, not fresh water?

A. Yes.

Q. What volumes are you proposing to inject?

A. We're proposing initially 1000 barrels of water per day.

Q. And the maximum injection rate would be what?

A. 1500.

Q. Will this be an open or a closed system?

A. Closed system.

Q. Will you be injecting under pressure?

A. Initially, due to some drainage, we don't think there will be any pressure, but it's potential that later it will be under pressure.

Q. So initially, by gravity, you -- What pressure would you propose to use?

A. Oh, 1000 pounds should be adequate.

Q. Would an injection pressure limitation of .2 pound per foot of depth to the top of the injection interval be adequate for Saga's purposes in this project?

A. Yes.

Q. If an increase was needed above that level, would those pressure increases be justified by step-rate tests witnessed by the Division?

A. Yes, they would.

Q. Does Exhibit Number 9 contain a water analysis of the injection fluids?

A. Yes, it does. It's a freshwater well.

Q. Is that what you're going to be injecting, or is that water in the area?

A. That is just the water in the area that's currently used by the ranch.

Q. And where is that in this exhibit?

A. It's approximately -- Oh, in the exhibit?

Q. Yes, what page? Page 21, the last page?

A. It's the last page.

Q. And how close is this to the injection well?

A. To the Number 4 injection well, it's approximately a half a mile northwest.

Q. Are there any other freshwater wells in the area?

A. No, there are not. There's -- This well has some Ogallala freshwater production, but it's very spotty and very random, and this is one of the few wells -- freshwater wells in the area.

Q. Are there any other freshwater zones in the area?

A. There's also some Santa Rosa, but it's more brackish and not potable.

Q. Have you examined the available engineering and geological data on this reservoir, and as a result of that examination have you found evidence of open faults or any

other hydrologic connection between the disposal or injection zone and any underground source of drinking water?

A. No.

Q. In your opinion, will approval of this Application and the implementation of this project be in the best interest of conservation, the prevention of waste and the protection of correlative rights?

A. Yes.

Q. Was Exhibit 9 prepared by you?

MR. CARR: At this time, Mr. Catanach, I move the admission of Saga Exhibit 9.

EXAMINER CATANACH: Exhibit 9 will be admitted as evidence.

MR. CARR: That concludes my direct examination of Mr. Clement.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Clement, do you know what the condition of the other two injection wells are at this point? Are they mechanically sound?

A. Yes, sir. They're current with all testing out of the Hobbs office of the OCD.

Q. Is there anything that needs to be amended with regards to the intervals that those wells are injecting

into, adding any perfs or changing anything in those wells?

A. Not at this time.

Q. Have those wells pretty much been active throughout the years, as far as you know?

A. The Number 11 was converted to saltwater disposal, I believe, in 1997, and the Number 6 in 1998.

Q. Okay, they're fairly recent, then?

A. Yes.

Q. The disposal well in Section 34, that's not going to be used, right?

A. Yes, it will.

Q. Okay. Is the one you want to permit in -- The one you want to permit is in --

A. Section --

Q. That's up in 27?

A. -- 27 --

Q. Okay.

A. -- Unit A.

Q. So the Number -- Is that Number 4?

A. Yes, sir.

Q. Is that an active well?

A. No, not at this time.

Q. Okay, but you may convert that later; is that what you're saying?

A. No, we will -- When the unit is approved, we will

convert the Number 4 in Unit A to injection.

Q. Right. What about the one in Section 34?

A. Yes, it will be -- Injection will resume into it at the same time.

Q. That's the one that was approved by R-3612?

A. Yes.

MR. CARR: Yes.

Q. (By Examiner Catanach) Okay, there's two Number 4's here, that's why it's a little bit confusing.

A. I'm sorry.

Q. Now, has that been inactive for a while?

A. Yes.

Q. Do you know how long it's been inactive?

A. At least three years.

Q. Probably -- The authority for that well is probably expired.

A. Okay.

Q. If this unit is approved and we authorize you to inject, you may have to make a subsequent application to get that approved administratively.

And have you satisfied yourself that all these wells, the area-of-review wells, are completed and cased and cemented adequately to confine the injection fluid?

A. Yes, I am.

Q. How about the plugged and abandoned wells?

A. Yes.

EXAMINER CATANACH: Okay, I have nothing further of this witness.

MR. CARR: Mr. Catanach, that concludes our presentation in this case.

EXAMINER CATANACH: Mr. Carr, one more thing, if you could. Could I get you to maybe do a summary of the negotiation process with these interest owners --

MR. CARR: We can do that.

EXAMINER CATANACH: -- what has occurred?

MR. CARR: The negotiations, Mr. Catanach, started back with the original voluntary unit, and they were very active at that time.

I don't know what happened right after the voluntary unit, but we have been involved in this effort since -- I believe it was in January of this year, during one of the prorationing meetings in Midland that we discussed going the statutory route. So it's been the better part of this year.

I'll give you a chronology showing what interest owners are involved and what contacts have been made.

EXAMINER CATANACH: Okay, that would be helpful.

MR. CARR: Yes, sir, be glad to do that.

EXAMINER CATANACH: Anything else?

MR. CARR: That's all we have.

EXAMINER CATANACH: Okay, there being nothing further in this case, Case 12,417 and 12,418 will be taken under advisement.

And this hearing is adjourned.

(Thereupon, these proceedings were concluded at 2:57 p.m.)

* * *

I hereby certify that the foregoing is a compleie record of the proceedings in the Examiner hearing of Case No. _____, heard by me on _____ 19____.

_____, 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 September 14th, 2000.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 2002