NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARING

SANTA FE, NEW MEXICO

Hearing Date JANUARY 24, 1991 Time: 8:15 A.M.

| NAME | REPRESENTING | LOCATION |
|---|---|---|
| James Bruce | Hinkle Law Firm | Albq. |
| ED OMAN | BRAVO OPERATING Co. | HOBBS |
| W. Perry Pearce | Campbell and Black, P.A. | Santa Fe |
| William F. Carr | Campbell and Black, P.A. | Santa Fe |
| Shari Gilbreath | [illegible] | [illegible] |
| Shari Hamilton | Yates Energy | " |
| Ben Bolack | Yates Energy | " |
| Bryan Jones | Hartman | Midland |
| Joanne Secter | Hartman | Santa Fe |
| Ernest L. Padilla | Padilla & Snyder | Santa Fe |
| Kenny Howell | DOI | Santa Fe |
| Lee Vo | Mobil | Midland |
| T R Moore | Phillips Petrol | Farmington |
| Richard Ty | Richard T. C. Tully, P.A. | Farmington |
| MICHAEL CUNNINGHAM | " | " |

NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARING

SANTA FE, NEW MEXICO

Hearing Date JANUARY 24, 1991 Time: 8:15 A.M.

| NAME | REPRESENTING | LOCATION |
|---|---|---|
| M.E. Cuba | Amoco | Denver |
| Jack McAnear | Amoco | Denver |
| Bill Hawkins | Amoco | " |
| Eric Nichols | " | " |
| Scott Hall | Miller Dugan & Hall | SF |
| Richard Virtue | | |
| Satin Thayer Boone | Nassau Resources | SF |
| Richard McBone | Gas Research Inst. | Chicago, IL |
| John Corbett | Giant Exploration | Farmington, NM |

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 CROSS TIMBERS OIL COMPANY

CASE NO. 10216

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: JAMES MORROW, Hearing Examiner

January 24, 1991

Santa Fe, New Mexico

This matter came on for hearing before the Oil Conservation Division on January 24, 1991, at 10:40 a.m. at Oil Conservation Division Conference Room, State Land Office Building, 310 Old Santa Fe Trail, Santa Fe, New Mexico, before Freda Donica, RPR, Certified Court Reporter No. 417, for the State of New Mexico.

FOR: OIL CONSERVATION DIVISION

BY: FREDA DONICA, RPR
Certified Court Reporter
CCR No. 417

(ORIGINAL)

# I N D E X

January 24, 1991
Examiner Hearing
CASE NO. 10216



* * *

## E X H I B I T S

A P P E A R A N C E S

FOR THE DIVISION: ROBERT G. STOVALL, ESQ.
General Counsel
Oil Conservation Commission
State Land Office Building
310 Old Santa Fe Trail
Santa Fe, New Mexico 87501

FOR THE APPLICANT: HINKLE LAW FIRM
Albuquerque, New Mexico
BY: JAMES BRUCE, ESQ.

Also Present: Ed Omar

HEARING EXAMINER: Now call case 10216.

MR. STOVALL: Application of Cross Timbers Oil Company to amend Division Order Number R-6849, Lea County, New Mexico.

HEARING EXAMINER: Call for appearances at this time.

MR. BRUCE: Mr. Examiner, my name is Jim Bruce from the Hinkle law firm in Albuquerque, representing the applicant. I have three witnesses to be sworn.

MR. OMAR: My name is Ed Omar, and I represent Bravo Operating Company. And I'm here to oppose the application.

HEARING EXAMINER: Do you plan to testify?

MR. OMAR: Yes, sir.

HEARING EXAMINER: Any other appearances? The witnesses will please stand and be sworn.

(Witnesses sworn.)

HEARING EXAMINER: Mr. Omar, what firm do you represent?

MR. OMAR: Bravo Operating Company.

MR. STOVALL: Are you an attorney?

MR. OMAR: No, I'm a petroleum engineer.

MR. STOVALL: Off the record for a minute.

(Off the record discussion.)

HEARING EXAMINER: Go ahead, Mr. Bruce.

EDWIN S. RYAN, JUNIOR

the witness herein, having been first duly sworn to testify,

testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Would you please state your full name and city of residence?

A. Edwin S. Ryan, Junior, Fort Worth, Texas.

Q. And who do you work for and in what capacity?

A. For Cross Timbers Oil Company as a landman.

Q. And have you previously testified before the OCD as a landman?

A. No, I have not.

Q. Would you outline your educational background and work experience for the Examiner?

A. I graduated from Washington & Lee University with a bachelor of arts in 1981. I went to work as a lease broker for Steele and Associates for a year, and then for Getty and Texaco for five years after that, and have been with Cross Timbers Oil Company for three years. I've also testified before the Oklahoma Corporation Commission.

Q. And are you familiar with the land matters involved in this case?

A. Yes, I am.

Q. And your area of responsibility includes southeast New Mexico?

A. Yes.

MR. BRUCE: Mr. Examiner. I tender Mr. Ryan as an expert.

HEARING EXAMINER: We'll accept his qualifications.

Q. (By Mr. Padilla) Briefly, Mr. Ryan, what does Cross Timbers seek in this case?

A. Cross Timbers is seeking to increase the gas-oil ratio in the West Nadine-Blinebry Pool from a current level of 4,000 to 1 to 10,000 to 1, and also to cancel the overproduction in the McCallister Number 4 well, which is operated by Cross Timbers.

Q. Would you please refer to Exhibit Number 1 and describe it for the Examiner?

A. Exhibit 1 is an outline of the pool which is located within Township 20 South, Range 38 East. It also -- and that is within the orange outline. The green outline is all acreage within a mile of the pool, and the yellow acreage -- the acreage colored in yellow is acreage owned by Cross Timbers.

Q. Was notice sent to the operators in the pool and outside the pool?

A. Yes, it was.

Q. And who did you send it to?

A. We sent it to all operators, lessees and unleased mineral owners within the pool, and all operators within a mile of the pool.

Q. Is Exhibit 2 a copy of your notice letter and a listing of the interest owners?

A. Yes, it is.

Q. And this notice was sent by first class mail, was it not?

A. Yes.

Q. When was this listing prepared?

A. The last week of December 1990.

Q. So it's current then, or at least current at the time of the application?

A. That's correct.

Q. Have any operators inside or outside the pool waived objection to this application?

A. Yes.

Q. And who is that?

A. Sirgo Operating, Inc.

Q. Is a copy of their waiver letter marked Exhibit 3?

A. Yes.

Q. In your opinion, is the granting of this application in the interest of conservative and the prevention of waste and the protection of correlative rights?

A. Yes.

Q. And were Exhibits 1 through 3 prepared by you,

under your direction, or compiled from company records?

A. Yes.

MR. BRUCE: Mr. Examiner, I move the admission of Exhibits 1 through 3.

HEARING EXAMINER: Exhibits 1 through 3 are admitted.

Mr. Omar, do you have any questions of Mr. Ryan?

MR. OMAR: Not at the present time.

MR. BRUCE: For the record, I would object to Mr. Omar cross-examining my witnesses.

MR. STOVALL: I think Mr. Omar can certainly testify. We'll allow the testimony. I think that's a valid objection.

I have a question, however. Was any notice sent by certified mail, return receipt cards?

THE WITNESS: No.

MR. BRUCE: Under the pool rules, Mr. Stovall, I think they just require first class mail under the OCD rules.

MR. STOVALL: I want to confirm that. Some notices do require --

HEARING EXAMINER: I'll ask Mr. Bruce to submit the pool rules and show us where that applies.

MR. BRUCE: I will do that.

MR. OMAR: May I ask a question, please?

HEARING EXAMINER: I believe we agreed that we'd offer you an opportunity to testify but that you wouldn't be able

to ask questions of witnesses. You can ask a question of Bob or myself, if you'd like to.

MR. OMAR: I'd just like to see some kind of justification for request of cancelling that allowable. I don't see any --

MR. STOVALL: I assume they're going to testify to that.

HEARING EXAMINER: Go ahead, Mr. Bruce.

MR. BRUCE: Call Mr. Peterson to the stand.

LEE M. PETERSON

the witness herein, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Would you please state your full name and city of residence?

A. My name is Lee M. Peterson. I live in Richland Hills, Texas.

Q. And who do you work for and in what capacity?

A. I'm employed by Cross Timbers Oil Company as a district geologist for the Permian district.

Q. And have you previously testified before the Oil Conservation Division?

A. No, sir.

Q. Would you please outline your educational

background and work experience?

A. I hold a bachelor of science degree in geology from Brigham Young University in Utah, granted in 1981. Since that time, I have practiced petroleum geology for ten years, seven of those years for Cities Service Oil and Gas Corporation and three years for Cross Timbers Oil Company. In addition, I have been established as an expert witness before the Texas Railroad Commission.

Q. And does your area of responsibility include southeast New Mexico?

A. It does. And, in fact, I have had this field and the surrounding area under study or under my responsibility for most of those ten years of my experience.

Q. Not only with Cross Timbers but with your prior employer?

A. Yes, sir.

Q. And thus you are intimately familiar with this pool and this area?

A. Yes, sir.

MR. BRUCE: Mr. Examiner, I tender the witness as an expert.

HEARING EXAMINER: We'll accept his qualifications.

Q. (By Mr. Bruce) Mr. Peterson, will you refer to Exhibit 4 and describe its contents for the Examiner?

A. Mr. Examiner, Exhibit 4 is a structure map

contoured on the top of the Blinebry formation with Cross Timbers' acreage marked in yellow. As a result of a subsurface study of the Blinebry formation in West Nadine Pool, including whole cores, sidewall cores, drill cuttings and electric logs and mud logs, it has been determined that the Blinebry formation with pool is extremely heterogeneous and that, in fact, it consists of not one pool but several pools. I would like to submit Exhibit Number 5.

Q. Would you please move on to Exhibit 5 then, Mr. Peterson? What is that, for the record?

A. Exhibit 5 is a type log of the section in the area. This happens to be the Cross Timbers Oil Company Christmas Number 2 well located in the northeast quarter of the northeast quarter of the northeast quarter of Section 7, in Township 20 South, 38 East. And for your reference, includes the top of the Glorieta formation above the Blinebry and the top of the Tubb formation below, and the Blinebry formation in between.

As you can see from this exhibit, as a result of the subsurface geological study, we have zoned the Blinebry formation into five different producing zones. And I found it interesting in earlier testimony today on docket number 10220 that Conoco, in speaking of the McKey Pool, which is one township to the south of us, came to the same conclusion in their study of the Blinebry formation, that there's also

five different vertical producing zones.

These five different producing vertical zones, Mr. Examiner, are the result of cyclic sedimentation when the Blinebry formation was deposited in a tidal flat environment. And the colors on this type log represent different things. The purple coloring in the density curves were the -- where the density is showing indicated negative porosity are the anhydritic portions of the reservoir, whereas the yellow and orange are those portions of the density and neutron curves respectively showing the porosity.

I guess the significance of this illustration and subsequent exhibits will be to show that the Blinebry reservoir is vertically stratified and that these five separate reservoirs are not in vertical communication with each other.

Q. Would you please move on then to Exhibit Number 6 also and describe its contents?

A. Mr. Examiner, Exhibit 6 then is a structure map contoured on the top of Zone 5 in the Blinebry, as defined by Exhibit 5. The reason I choose to focus on Exhibit 5 at this time is that this is the zone from which the McCallister Number 4 well in Section 5 is producing from at the current time from which we wish to cancel the overproduction.

HEARING EXAMINER: That's on Exhibit 5?

THE WITNESS: Yes, sir. Zone 5 is defined on Exhibit 5, and Exhibit 6 is the structure map showing the location of not only the McCallister 4 but also all other wells in the West Nadine Pool are marked that are currently producing from Zone 5.

HEARING EXAMINER: McCallister 4 is the one that you want to hold the production?

THE WITNESS: Yes, sir.

Q. (By Mr. Bruce) What is Exhibit 7, Mr. Peterson?

A. Mr. Examiner, Exhibit 7 is a net porosity isopach of Zone 5 in the West Nadine Pool. The significance of this exhibit is to show that not only is the Blinebry formation vertically stratified and separated, but is also horizontally separated as well. And from this isopach map which I have made I conclude that there are at least three and possibly more separate reservoirs in just Zone 5 of the Blinebry formation.

I would call your attention again to those wells which are circled as producing from Zone 5, particularly the McCallister Number 3 well in the northeast quarter of the northwest quarter of Section 8. This well although -- has an indicated 17 feet of net pay from electric log analysis, which is more feet of net pay than McCallister 4, is only capable of making five barrels a day from the Zone 5

Blinebry, which is much, much less than the production capable of the McCallister Number 4.

I point this out to illustrate the fact that the pay in the Blinebry formation is not always continuous or not always permeable, even if it's indicated porosity. And there's a great deal of risk involved in completing these wells in Zone 5 that even if there's indicated porosity there may not be commercial production due to low permeability.

Q. Would you please move on to Exhibits 8 and 9 and describe their contents for the Examiner and discuss the continuity of Zone 5 further?

A. Mr. Examiner, Exhibit 8 is a stratigraphic cross-section hung on the top of Zone 5 that passes through the McCallister Number 4, the well in question. And I think this cross-section will show the Examiner that the porosity which is productive in the McCallister Number 4 there near the top is not present in either the Tamarack Petroleum well on the east, or the Bravo Antweil -- excuse me, Bravo Louie Number 2 well to the northwest, and that these wells are 40-acre offsets but yet the separation of these reservoirs is such that the reservoir is not present on 40 location away on either side.

I'd also like to apologize to the Examiner for labeling on these cross-sections and maps all the wells

which are currently operated by Bravo Operating Company as Antweil. We were working from base maps which were not up-to-date, so anywhere that you read "Antweil" you should read "Bravo" on these exhibits.

In addition, Exhibit 9, Mr. Examiner, shows a similar picture to Exhibit 8. It is an east-west stratigraphic cross-section also hung in the top of Zone 5, going through the southern part of Cross Timbers' leasehold. And it shows also that in one 40-acre location away between the Cross Timbers McCallister Number 2 and the Cross Timbers McCallister Number 3, that most of the pay is gone.

Q. So from these you draw a conclusion that Zone 5, the one in particular interest today, is not continuous across the pool; is that correct?

A. That is correct.

Q. In your opinion, is the granting of this application in the interest of conservative, the prevention of waste and the protection of correlative rights?

A. It is.

Q. Were Exhibits 4 through 9 prepared by you or under your direction?

A. Yes, sir, they were.

MR. BRUCE: Mr. Examiner, I move the admission of Exhibits 4 through 9.

HEARING EXAMINER: 4 through 9 are admitted.

Mr. Peterson, are any wells except number 4, McCallister Number 4, exceeding the current GOR limit?

THE WITNESS: No, sir.

HEARING EXAMINER: That's the only well that needs the relief?

THE WITNESS: Yes, sir. The other wells are such poor wells that they don't require that relief.

HEARING EXAMINER: Are Zones 1 through 4, do they produce at a high gas-oil ratio or not?

THE WITNESS: Mr. Examiner, I'm not sure I'm qualified to answer that. I may, if I could, defer that question to the reservoir engineer who will testify after me.

HEARING EXAMINER: All right.

Bob, do you have anything?

MR. STOVALL: I don't think so at this time.

HEARING EXAMINER: The witness may be excused.

JOHN MARK O'RIER

The witness herein, having been sworn to testify the truth, the whole truth, and nothing but the truth, testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

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

A. My name is John Mark O'Rier.

Q. And where do you reside?
A. I reside in Fort Worth, Texas.
Q. And who are you employed by?
A. Cross Timbers Oil Company.
Q. What is your job at Cross Timbers?
A. I'm a reservoir engineer.
Q. Have you previously testified before the OCD?
A. No, I have not; but I've been submitted as an expert witness to the Oklahoma Corporation Commission and the Texas Railroad Commission.
Q. Would you briefly discuss your educational background and work background also?
A. Yes, I have a BS in petroleum engineering from the University of Texas, obtained in December of 1980. I worked for Cities Service Oil and Gas subsequent to that.
Q. As a reservoir engineer?
A. As a production and as a reservoir engineer. Between '80 and '84 I obtained an M.B.A. from SMU subsequent to that time period and then worked for Texas American Bank as a reservoir engineer and loan officer. Then I've been working for Cross Timbers for three years since that time.
Q. And does your area of responsibility at Cross Timbers include southeast New Mexico?
A. Yes, it does.
Q. Are you familiar with the engineering matters

involved in this case?

A. Yes, I am.

MR. BRUCE: Mr. Examiner, I tender the witness as an expert.

HEARING EXAMINER: We accept his qualifications.

Q. (By Mr. Bruce) Mr. O'Rier, would you please discuss briefly what brought about this application?

A. What brought about this application was primarily our recompletion of the McCallister Number 4, which originally was completed in what we're calling Zones 1 and Zones 2 in 4 of '83. And we went back in in 4 of '90 to open additional pay. At that time, we opened additional pay in Zones 3 and Zones 5, Zone 4 not being well developed in this location.

When we were testing, we perforated Zone 3 and Zone 5 and then set a packer above Zone 5 to test it individually. And to our surprise, it, after acid only, kicked off flowing at very high rates of oil. And at first we thought that the oil allowable would be our problem, but the oil production quickly fell off, and at the same time the gas production started increasing to the point at which we were exceeding our maximum GOR allowable. And so we -- through testing of the McCallister 4 and trying to determine the effects of producing a gas rate at or below the 568 maximum allowable, we determined that the best way for us to

produce our correlative oil rights in this location would be to get the GOR increased.

Q. And, briefly, in testing the well, did producing gas below the allowable affect oil production?

A. Yes, it did. When we tried to reduce the gas rate to below the 568 limit, our oil production went from on the order of 70 to 90 barrels to the order of 10 barrels a day.

Q. Referring to Exhibit Number 10, would you describe the production history of the pool and some production from the wells in the pool in a little more detail?

A. The initial Blinebry -- well, Exhibit 10 is a current rate and cumulative production map of all the wells in the Blinebry pool. The discovery well for the Blinebry -- West Nadine Blinebry Pool is the Tamarack Number 1 Speight over in Section 9, in the northwest quarter of Section 9. The total wells completed in the pool are 42, including the Speight, and those wells were drilled between 1980 and 1986. Cumulative production through July of 1990 is 2.2 million barrels and 5.2 BCF.

As you can see from this map, each well has a pinwheel on it which indicates which zone it is producing from. I'll point out a couple of things to you, one of which is that the majority of the wells in the pool are

producing from what we're calling Zones 1 and Zones 2. And I also point out that of the seven completions in Zone 5, five of them are on our own leasehold interest.

From studying the reservoir in general, we've determined that the drive mechanism for Zone 1 is purely solution gas drive. We're also determined that Zone 2 has a combination gas cap and solution gas drive mechanism. And Zone 5, we have determined, has a combination in particular areas, especially ours. We've found that it has a combination gas cap and solution gas drive, and that Zones 3 and 4 have not been tested adequately to know exactly what the drive mechanism is.

Q. Now, you mentioned five of the seven Zone 5 wells are in Cross Timbers lease. The other two which are to the southeast of Cross Timbers lease, are those, in your opinion, in a separate reservoir?

A. Yes, they are.

Q. Why was the 4,000 to 1 GOR initially adopted for this pool? And I would refer you to Exhibits 11 and 12.

A. Exhibit 11 presents one of the original exhibits in case 7419 in which Antweil was trying to get the limit increased from 2,000 to 4,000. And as you can see from this exhibit and testimony indicated in the records, the purpose for increasing the allowable at that time from 2,000 to 4,000 was to allow specific production from one well, that

being the Albert Number 1, which at that point in time exceeded the maximum GOR limit of 2,000 to 1.

Exhibit 12 was also presented in that case, and it indicated other GORs of other pools in this district. I'll note that of those pools, two of them have GORs greater than 9,000, which is close to what we're asking for, and one of them has a GOR in excess of 31,000. So the primary evidence presented in the original limiting GOR hearing to increase it from 2,000 to 4,000 was an analogy with other pools and the need to change the limit to produce one specific well.

Q. How does the GOR in the McCallister Number 4 well, the one you seek to cancel overproduction on, compare with the GOR for other wells in this pool? And I would refer you to Exhibit 13.

A. Exhibit 13 is a GOR comparison of all the wells in the West Nadine Blinebry Pool. As you can see, they're listed in order by operator. And you notice under Cross Timbers and McCallister Number 4 we're showing a GOR at this point in time of 8,000, which is less than some of the other wells in the pool. Several -- many of the wells are producing GORs in excess of the current limit, and some of which are producing at higher GORs than what we're asking for. I would like to point out that it just happens to be that our well is the only well in the pool that has

production capable of exceeding the maximum limit.

Q. And how does the requested 10,000 to 1 GOR compare with actual GORs from other Blinebry pools in southeast New Mexico?

A. Exhibit 14 is a GOR comparison of other Blinebry pools as of August 1990. And you'll see that there's a variety of different producing GORs, several of which exceed the 10,000 to 1 we're asking for, and one of which is almost added, and several others are in excess of the current limit that we are under right now, the 4,000 to 1.

Q. And the Blinebry oil and gas pool was the subject of the prior Conoco case today, was it not?

A. I believe it was.

Q. Referring to Exhibits 15 and 16, would you discuss in a little more detail what zones are productive in the wells in this pool? And I would also ask you to refer to Exhibit Number 6 to some extent.

A. Yes, it would be helpful in the discussion of Exhibits 15 and 16 to have ready Exhibit 6, which is the structure map of the top of the Blinebry fifth zone. The purpose of this exhibit is basically to show, according to our zonation, where the wells in Cross Timbers' leasehold interest are completed and to help the Examiner understand our position that each zone acts independently of one another and that production from one zone does not affect

the production from another zone. You can see most all the wells are producing from Zone 1 with the exceptions of Christmas 2 and McCallister 2, which is on Exhibit 15. And I will also point out that the development of these upper zones occurred early in the 1980s, yet when we completed Zone 5 in the McCallister 4 in 4 of '90, it had virgin pressure.

HEARING EXAMINER: Would you say that again, that last sentence?

THE WITNESS: I'm saying even though the upper zones had been developed in the early eighties and had been producing for long periods of time prior to our recompletion of the McCallister 4, we found virgin pressure in Zone 5 in McCallister 4, which also indicated -- let me just go through the history of the development of Zone 5, both by the previous operator to this acreage, which was Crown Central, and then our own development since we have assumed operations of it.

The original completion in Zone 5 was the McCallister 1 in 6 of '83, and that's on Exhibit 16, and it's labeled number 5 across the top. Zone 5 --

MR. STOVALL: Exhibit 15, I believe.

HEARING EXAMINER: I think it is 15.

THE WITNESS: I'm sorry. I marked them backwards. Exhibit 15, well number 5 across, going from left to right,

there at the bottom you see Zone 5 was tested in McCallister 1 in 6 of '83. I would like to point out that this particular well was an old well bore that had a liner run in it and had a very poor cement job. So getting individual tests in this was difficult. However, they were able to ascertain with some reasonable degree of certainty that Zone 5 was a gas -- was gas productive in that location. So it was plugged back and then only produced from Zones 1 and Zones 2 and, to some degrees, Zone 3.

The next well that was completed in this pool in Zone 5 was the Moran 2 in 11-84, and that is number 4 on the same exhibit. Zone 5 on the Moran 2 was completed with other zones in this well bore. It was acidized only, but there was no indication of any gas production in the Moran 2. And I would like to refer back to Exhibit 6, and you'll notice on the structure map that Moran 2 is structurally high to the McCallister 4 in this location. That indicates to some degree that the Moran 2 is producing from a separate reservoir from McCallister 4.

The next well that was completed in -- by Crown Central in this leasehold interest was the Turner Number 3, which is number 2 on the next exhibit. It was also completed with other zones and acidized only. And as with the Moran 2, there was no indication of gas production from that particular zone. And it also is structurally high to

the McCallister 4, according to our structure map. And those two wells, in conjunction with what we found in the McCallister 4, gave us a high degree of certainty that you were dealing with more than one reservoir, even on our own leasehold interest.

The next well that was completed after the McCallister 4 was the Cross Timbers completion of the McCallister 3, which is on Exhibit 16, number 4. And you can see its relationship to the McCallister 4. It's basically southeast of the McCallister 4. And it's also the only well in our leasehold interest that's down-dipped to the McCallister 4. We've completed -- although if you'll recall from one of the previous cross-sections, the McCallister 3, we were showing 17 feet of pay, however, the pay quality didn't appear to be near the quality of the McCallister 4.

We completed it in hopes of being able to produce a well at a down-dip location to the McCallister 4 in order to -- and this was subsequent to the fact that we found that we were starting to produce high gas rates out of the McCallister 4. So in an attempt taken to produce at a lower structural position, we went to the McCallister 3. Unfortunately, the pay quality was not sufficient in that well -- the permeability, apparently, was not sufficient in that well to give anything more than five barrels a day in

rate.

And so after the next completion that we went to in this field was the Leonard 2, and it was shortly thereafter the McCallister 3. And the theory behind hitting the Leonard 2 in Zone 5 was that because of the Moran 2 and the Turner 3 which I referred to a little bit earlier, it appeared that the Leonard 2, while although still structurally high to the McCallister 4, was also in a separate reservoir than the McCallister 4. And this was a very successful completion but also proved our theory that there was not a producing gas cap over in this area. And it basically defined the gas cap in this zone to a location probably between McCallister 1 and perhaps the Christmas 2 and the McCallister 2.

HEARING EXAMINER: You're talking about the Leonard 2?

THE WITNESS: Yes. The Leonard 2 confirmed our theory that we were dealing with more than one reservoir in Zone 5 on our own leasehold interest.

HEARING EXAMINER: You say 13 barrels a day?

THE WITNESS: Yes, pumping under a packer. And when we combine it with the other zones, we found that it was actually capable of producing at higher rates than that. At that point in time, we were pumping it under a packer because the other ones were open, and so the pump efficiency was very low because there was enough GOR to inhibit the --

we were probably pumping it at 50 percent efficiency, I'm guessing.

And after we finished putting all the zones back together, it was apparent that Zone 5 was more than likely contributing a little bit more than 13 barrels a day. But at the same time, there was no indication that you were producing very high volumes of gas out of it which would lead you to believe that the gas cap extended all the way over here.

Q. (By Mr. Bruce) In your opinion, would a new or another Zone 5 well completion down-dip from the McCallister 4 be risky?

A. Yes. Are you talking about a new drill?

Q. Yes.

A. A new drill, in our opinion, would be very risky. And we charted the McCallister 3, and the indications are that you lose reservoir quality very quickly when you move structurally down-dip in this particular zone. And so, in our opinion, we were faced with only being able to produce our correlative oil rights from that particular well bore because you could not -- drilling a new well would be too risky for us to assume that responsibility.

Q. Do you have anything further on those set of exhibits?

A. Oh, also, just as a point, it -- the poor pay quality in McCallister 3 indicates it is not -- even though it's not really in good communication with what you're producing out of the McCallister 4, and therefore it's our position that all these wells that are down-dip and in poor pay quality would be dominated by solution gas drive and would not really be affected by the gas cap that's in contact with McCallister 4 to any degree. I mean, when you're producing from such a tight reservoir, you're totally dominated by solution gas drive.

Q. Would you now move on to Exhibits 17, 18 and 19 and discuss the production history from the McCallister Number 4 since you recompleted it?

A. Okay. Exhibit 17 is a daily plot from Zone 5 only since its inception in April of 1990. I would like to point out that at this point in time, or when this well was completed and producing, during this whole period of time, we were producing it with VOPs on the well with tubing six feet in the air. It had a Zone 3 that was above a packer that it had been perforated and never treated, so the workover was not complete. And we were so surprised by this, we just sat on it, trying to figure out what to do with it, to be honest.

And so you can -- you know, going back to the initial phases of it -- I'll just walk you through this

production plot and give you some idea what we were trying to do throughout the history of this Zone 5 production. You can see early in the life of the well, from days zero to days 24, the well came on at about 250 barrels a day and started falling off a little bit. You were producing solution gas rates that would imply solution gas and not gas cap production. However, between days 24 and days 60 the gas started increasing very substantially and the GOR started going up too substantially. At that point in time, we had a very high degree of trouble producing this well. We had to choke freezings off. It was hard to keep the well on production. That's why you see the erratic production in this area of the curve from a time period of 36 to 60.

At that point in time, we installed an insulated and heated choke, which apparently had no effect on our ability to keep it from freezing off. At that point in time we just decided to open up the choke a little bit in the hopes that perhaps the gas rate -- it was a temporary phenomenon -- the gas rate would start falling back off again, and by the fact that we'd have to shut the well in to -- basically to produce it at any lower gas rate. And so you can see, we held the choke constant during this period of time because we were concerned about our gas rates. And you can see the effect in the oil production. Just by holding the choke constant at that time, the oil rates went

from 100 barrels a day down to over 40 or 50 barrels a day. I would like to note that from days approximately a little before 84 and a little after 84, which would represent the time period of around July 16th and in the eight days subsequent, we shut the well in for pressure buildup in order to try to ascertain what kind of animal we were dealing with in this zone. So that's the reason for the gap in production during that time period.

Then we brought the well back on at the same choke size. And it -- apparently, the well was loading up due to low fluid velocity in the tubing because of the choke size we were producing at. There's two more gaps in the production which is just simply no data. We were forced to use our test separator at different locations during those time periods. And you can see that we held the choke constant during that time, and we were producing at rates that were much less than what you'll see later on in the production plot.

If you move over to around days -- between days -- around days 204 and beyond, you'll notice that at that point in time we opened up the choke and our oil production jumped back up from the 40 to 50 barrel-a-day range back up to the 80 to 90 barrel-a-day range. And we opened up again to keep it from freezing off and to maintain our oil production. And you can see that the gas rates increased

slightly, but we had found basically through all this testing our most efficient manner in which to produce at least the oil production.

And about this time we received notification from the OCD to -- that we were overproduced. And so we began testing the effect of producing -- in preparation for this hearing for producing the well at rates below the maximum 568 MCF a day.

And I'll refer you to the next two exhibits, which would be Exhibits 18 and 19. Exhibit 18 is -- highlights that area in which you'll -- you see at the tail end of this Exhibit 17, you see the oil production going down and the GOR going up. The time period on Exhibit 18 is from approximately 11-21 'til the end of December. You can see the oil rate was between 80 and 90 barrels a day, relatively constant. When we decrease the choke size in order to reduce the gas rate, as you can see on Exhibit 19, you can see the effect of the flow and tubing pressure when we reduced the choke size to get our rate below 568. The tubing pressure went from order of 800 pounds to the order of 1,200 pounds. Our GOR approached 100 to 1, and our oil rate declined substantially, almost instantaneously, from 80 barrels a day to the order of 10 to 20 barrels a day.

And after producing that way for approximately a week, we opened it back up to see -- we opened it back up at

this point in time in preparation for running another bottom hole pressure buildup, which at the end of this time period the well was shut in to run a buildup. And we ran an eight-day buildup in order to comply -- to shut it in to comply with OCD. And we're currently testing the productivity of Zone 3 just to see what it's like.

An interesting note on the buildup that we saw in July of 1990 showed a bottom hole flowing pressure of about 1,800 pounds, yet six months later when we ran another buildup, our flowing bottom hole pressure declined to 950 pounds, which further indicates -- it confirms that we are dealing with a limited reservoir that's producing itself out pretty quickly.

Q. Would you please summarize the reasons that you seek to cancel the overproduction on the McCallister Number 4?

A. Well, primarily because the well has not completed yet. I think I have provided evidence that we've been testing this well, trying to understand what -- the production capabilities of it and what's the most efficient rate at which to produce it. We have kept the OCD fully informed on everything that we were doing. And in the beginning, we needed to open the choke and produce at these rates in order to maintain any oil production, and because of the fact it's a limited reservoir, we don't believe that

any gas production we have had out of the Zone 5 is affecting any production from any other well currently producing in the reservoir.

Q. Will increasing the GOR have an adverse effect on the recovery of oil and gas from this pool or from Zone 5?

A. Would you repeat the question?

Q. Would increasing the GOR have an adverse effect on recovery of oil and gas from Zone 5?

A. No, I do not believe so. In fact, I think it would have just the opposite because -- let me -- increasing the GOR would help the recovery of it because without increasing the GOR we would not be capable of producing at our most efficient rate, which would be somewhere where we can get our 80 to 90 barrels a day out of this well bore.

Q. Now, you heard Mr. Peterson testify that each zone is, in essence, a different pool, did you not?

A. Yes.

Q. Do you agree with that from an engineering standpoint?

A. Yes.

Q. Now, instead of requesting the GOR increase, if you had requested a new pool designation, what would your discovery allowable be?

A. The discovery allowable would have been 31,000 barrels at 125 million.

Q. And would that have been sufficient to alleviate your overproduction?

A. Very much so.

Q. As a result of your workover of the McCallister Number 4 and of the other wells in your lease, does Cross Timbers anticipate recompleting any other wells?

A. We believe that we have two locations that would have a similar problem, that being the Christmas 2 and the McCallister 2.

Q. Where are they located?

A. The Christmas 2 is the type log that we've referred to, and it's in the northeast northeast of Section 7. And the McCallister 2 is in the northwest northwest of Section 8. Both of these wells, we believe, have both -- have an oil column in -- you know, in the pay. There's both an oil column and a gas capsule. We believe we would have a similar type problem there that we're having in McCallister 4.

Q. In your opinion, will an increased GOR damage the reservoir?

A. No, sir.

Q. In your opinion, is the granting of this application in the interest of conservation, the prevention of waste and the protection of correlative rights?

A. Yes.

Q. And were Exhibits 10 through 19 prepared by you or under your direction?

A. Yes.

MR. BRUCE: Mr. Examiner, I move the admission of Exhibits 10 through 19.

HEARING EXAMINER: Exhibits 10 through 19 are admitted.

Mr. O'Rier, on Exhibit 13, there was an indication that well number 4 was making about 20,000 barrels a month; is that correct?

THE WITNESS: That's gas. Are you talking about our McCallister Number 4?

HEARING EXAMINER: Right.

THE WITNESS: The MCF per month was 20,949 and the barrels per month were 2,576.

HEARING EXAMINER: So at that time it was making 90 barrels a day?

THE WITNESS: Correct.

HEARING EXAMINER: How much is it overproduced?

THE WITNESS: Our calculations indicate it's approximately two to two-and-a-half months overproduced.

HEARING EXAMINER: How many barrels is that?

THE WITNESS: It works out to approximately 42 million overproduced.

HEARING EXAMINER: 43 million gas?

THE WITNESS: Gas. No overproduction in oil.

HEARING EXAMINER: Do you have a limited -- is your oil allowable limited due to the GOR or not?

THE WITNESS: No, we're -- except for the first ten days, we were never exceeding our oil allowable, and on a monthly basis we never had a problem with our oil allowable in this well.

HEARING EXAMINER: Your oil allowable is not penalized. You hadn't tested it yet, I guess, or maybe a test is not required in that pool. I'm not sure whether it is or not.

THE WITNESS: I'm not sure I understand. It was my impression that the oil allowable for this pool was 142 barrels a day. Within a very short period of time we were producing oil at rates significantly less than that. We've not had a problem with overproducing on oil. It's only been our gas that we've been overproducing.

HEARING EXAMINER: So on the proration schedule right now you have written in there 142 barrels a day?

THE WITNESS: Correct.

HEARING EXAMINER: No GOR penalty?

THE WITNESS: Right.

HEARING EXAMINER: You said that the overproduction on gas is 43 MMCF?

THE WITNESS: Correct.

HEARING EXAMINER: And 568, that's four times the 142, I guess; is that correct?

THE WITNESS: Correct.

HEARING EXAMINER: You went through some cumulative -- statements about cumulative recovery when you were testifying on Exhibit Number 10, and I didn't pick up on all that. Would you repeat that, please?

THE WITNESS: We -- public data indicates the West Nadine Blinebry Pool has a total cumulative production of 2.2 million barrels and 5.2 BCF. Is that the figures you were concerned about?

HEARING EXAMINER: Tell me the gas again.

THE WITNESS: 5.2 BCF.

HEARING EXAMINER: That's the current cumulative recovery from the pool?

THE WITNESS: As of July of 1990 from public data.

HEARING EXAMINER: Was this Antweil Albert Number 5 that you talked about on Exhibit 11, did it produce from Zone Number 5?

THE WITNESS: Albert Number 1?

HEARING EXAMINER: Albert Number 1.

THE WITNESS: No, sir. Our public data indicates that it produced from Zones 1 and Zones 2.

HEARING EXAMINER: On Exhibits 14 and -- or 15 and 16 there's some numbers down at the bottom of each of the bars that you've drawn there to represent well bores. Tell me what those mean. Like on McCallister Number 4, it says down

at the bottom 31 91 67 4 99 11 90.

THE WITNESS: On McCallister Number 4?

HEARING EXAMINER: No, McCallister Number 3 I was looking at, as well as number 4.

THE WITNESS: I'm sorry, I guess we didn't define that. The top left number is the current oil rate in barrels per day. The top right-hand figure is the current rate in MCF per day, and the bottom left figure is a cumulative oil production for the well. The middle figure is a cumulative gas production in MMCF, and the oil is in -- that 167 refers to 167,000 barrels, so 167 MBO. The bottom left is the cumulative in MBO, and the bottom right-hand figure is the date at which that cumulative represents. In other words, this cumulative is as of 11-90.

HEARING EXAMINER: And the gas is MMCF?

THE WITNESS: Yes, sir.

HEARING EXAMINER: And 1, 2, 3, 4, 5 means the zones they're currently open in?

THE WITNESS: Correct.

HEARING EXAMINER: And what about the pressure differences in Zone 5 as compared to other zones? You've talked about drives.

THE WITNESS: We estimate that Zones 1 and Zones 2 have a pressure of approximately 1,200 PSI, yet Zone 5, we were showing a static reservoir pressure in Zone 5, according on

our buildup in 7 of '90, approaching 2,300 pounds, which is very close to what we would consider virgin pressure for this zone. At that time the well produced for four months, I guess.

HEARING EXAMINER: Do you think you'll lose any gas or oil into those other zones from Zone Number 5 by having it open together with those zones?

THE WITNESS: That was our concern, that's why we have left the well the way it was. We were worried about cross flow into the upper zones if we didn't set a packer and keep them isolated.

HEARING EXAMINER: Do you have a packer in there now?

THE WITNESS: Yes, sir, we do. Well, right now we have a bridge plug above Zone 5 to shut it off, and then we were swab-testing Zone 3 to see what it would do. So Zone 5 has been isolated and remains isolated.

HEARING EXAMINER: It's your plan to continue to do that?

THE WITNESS: It is our plan to go back -- assuming that this limit increase is approved, it is our plan to go back and produce Zone 5 solely, because it's our feeling that if we try to produce the other zones in conjunction with Zone 5, it would have the same effect that we saw by changing the choke size. In other words, this zone appears to be very sensitive to flowing bottom hole pressure. And

any hydrostatic head you put on top of it, either by reducing your choke size or by increasing your hydrostatic head due to fluid falling from the other zones, we believe, would have the same effect of shutting off the oil production from Zone 5 as trying to produce at a lower gas rate. Is that clear?

HEARING EXAMINER: Yes, I think I picked up on part of that.

THE WITNESS: In other words, we feel like the fluid head, by comingling all these zones, would have the same effect that we showed earlier on these production tests of reducing the oil rate out of this zone. So we're very concerned about what we should do with this zone in relation to the other ones because we think not only would comingling the zones at this point in time hurt our production, but choking it back would also hurt our production.

HEARING EXAMINER: You have comingled it in the other wells where you had --

THE WITNESS: Where we had no indication that we had this kind of production mechanism. Those other wells showed no indication of having any gas productivity of any degree or anything above the solution gas rates.

HEARING EXAMINER: See the amount of interval opened in McCallister Number 4 in Zone 5 is -- looks like on Exhibit 15, tell me how much that is.

THE WITNESS: Sixty-four to 87; that's 23 feet.

HEARING EXAMINER: Did your log on this particular well indicate that that was all one interval, or were there stringers within that 23 feet?

THE WITNESS: In this particular zone, we think it's -- if there's stringers, they're real close together.

HEARING EXAMINER: I don't believe you submitted a log for --

THE WITNESS: Yes, the Exhibit 8 -- no -- one of the two cross-sections that Mr. Peterson presented earlier has the McCallister 4 Zone 5 well log presented.

MR. BRUCE: I believe it's number 8, Mr. Examiner.

THE WITNESS: You can see that there's some minor stratification through there.

HEARING EXAMINER: I guess -- yes, here it is.

THE WITNESS: If you'll compare that well with McCallister 3, you'll see part of the difference between the log quality. The net pay on McCallister 3, which is on the other exhibit, the net pay was more broken up.

HEARING EXAMINER: It's hard for me to read those numbers on the cross-section, but it is in the lower part of the zone, I believe; is that correct, the perforations?

THE WITNESS: The perforations are at the very top of the zone. The perforations basically extend where -- that upper portion that's colored in yellow.

HEARING EXAMINER: All right. On Exhibits 17, 18 and 19, is the data there -- is that -- each of those points represent a daily measured test?

THE WITNESS: Yes, sir. We've had a test separator on this well almost from -- almost throughout its entire Zone 5 production history.

HEARING EXAMINER: Looking at those three exhibits together, do they correlate there as they appear to? Let's see, the -- were you measuring the bottom hole pressures while you were testing?

THE WITNESS: No. The pressure that we have, what's labeled as FTP is our measured flowing tubing pressure, which is the surface pressure.

HEARING EXAMINER: So these two do match up like this; is that correct?

THE WITNESS: Yes, sir.

HEARING EXAMINER: Is that --

THE WITNESS: The data is exactly the same. We just highlighted it on these other sheets.

HEARING EXAMINER: This point here is this sinking point on these other two exhibits?

THE WITNESS: Exactly. We thought that it was easier -- would be easier to see by highlighting that particular area of the curve.

MR. STOVALL: For the record, Mr. Examiner, I point out

that you're looking at, it appears to me, Exhibits 17, 18 and 19; is that correct?

HEARING EXAMINER: Correct. So the gas -- the GOR, while it declined substantially when you produced at a higher rate, the gas production also declined; is that correct?

THE WITNESS: Are you referring to --

HEARING EXAMINER: I'm referring now to Exhibit Number 17.

THE WITNESS: Actually, the way it occurred is that we reduced the gas rate to the level at which we were below the maximum allowable, and in doing so our oil production was affected to the degree you see on Exhibit 18.

HEARING EXAMINER: So the actual gas rate is the red --

THE WITNESS: Correct.

HEARING EXAMINER: -- curve.

THE WITNESS: And the gas rate was what was altered, and the oil rate was the result of altering the gas rate.

HEARING EXAMINER: So both rates went down or went down -- let's see, the oil went down, the gas went down, but the GOR went up?

THE WITNESS: Correct. The gas rate went down on purpose, but the oil rate did not.

HEARING EXAMINER: It went down --

THE WITNESS: But not on purpose.

HEARING EXAMINER: You indicated you shut in to comply with OCD. You meant you were making up overproduction?

THE WITNESS: We received notice of overproduction, and so we were trying to comply with that notice.

HEARING EXAMINER: That's all the questions I have.

EXAMINATION

BY MR. STOVALL:

Q. Looking at Exhibit 17, am I correct in understanding that the overproduction started to occur around day 228, which is about the 7th of December, or was it prior to that that that was occurring?

A. I would say that the overproduction occurred between day 60 and day 252. In other words, if you'll look at the gas scale that is in red on the left-hand side, says gas MCF per day, if you look at the first line that's going across, the lower line that's going across, you'll look at -- the scale there says 1,000.

If you'll notice, the very bottom of that scale is 100. So the next mark up would be 200, then 300, then 400, then 500. If you take that 500 point across, you'll notice when the well first started increasing in gas rate, it leveled out about at what our maximum allowable gas rate is, that is, 568 a day.

And then you'll notice almost at day 60 the gas rate jumped again, and at that point in time we were

beginning to exceed our allowable. That's the point in time when we were trying to -- you know, we decided we were -- we needed to shut the well in for a buildup to see what was going on. And we were holding our choke constant so that it didn't get any more out of hand, hoping that it would just stabilize out at a lower rate. And it became apparent as we continued to produce this that that was not going to occur, so that's the reason why we are here today.

Q. And if I'm reading that exhibit correctly, what was happening starting about day 84 is your gas rate was becoming constant but your oil rate was going down, which resulted in greater overproduction at the same rate of gas production.

A. It's my understanding that the overproduction of gas is tied solely to the 568 a day maximum. And what was happening during that time period, I believe, was because we were holding the choke constant to avoid any further overproduction than we were having at that point in time, our oil rate was suffering. That's when we decided we needed to start testing what our efficient rate would be out of this. And through our pressure buildup analysis and by playing around with the choke, we found that we needed to have it open more, and by pulling back the gas rate to below the 568, we were -- we would severely hamper our oil production.

I believe that that time period after the buildup where the oil rate was going down, the well was loading up due to low fluid velocity in the tubing because we had it choked back too much during that period of time. And that theory is confirmed by the fact that when we opened it up, more lowering the fluid velocity in the tubing, our oil rate jumped back up.

Q. During this time period then as you were becoming overproduced, you were -- do I understand that you were aware of what was going on and you were trying to figure out what the cause was and what the solution was?

A. Correct. That's -- like I say, that's why we've run two buildups on this thing. And, you know, we were hoping it would be a temporary phenomenon. And it didn't -- we finally realized that it was going to be less temporary than we thought.

Q. If you were not allowed to -- if your overproduction of -- gas overproduction were not cancelled, what would you have to do to make that up?

A. We'd have to shut it in for two-and-a-half months.

Q. Do you think that would damage the reservoir at all?

A. It probably would not damage it, but you never know.

HEARING EXAMINER: If this application weren't granted, it would seem that the most efficient way to produce the well would be intermittently.

THE WITNESS: Correct.

Q. (By Mr. Stovall) When I look at Exhibit 13, and looking at any of the higher -- above 4,000 GOR wells, you've indicated the McCallister Number 4 is the only one which is overproduced; is that correct?

A. No, sir. What I was trying to imply when I made that statement was that McCallister 4 is the only well -- oh, okay, yes, you're right. What I was trying to say is that that's the only well in the field capable of producing at rates that would exceed our maximum allowable.

Q. It's the only one overproduced because it's the only one capable of becoming overproduced, not because the others have been production limited to avoid overproduction.

A. Correct.

HEARING EXAMINER: I think on that exhibit you point out that the GORs were higher but they weren't making enough oil to exceed the gas limit?

THE WITNESS: They weren't making enough gas to exceed the gas limit.

MR. STOVALL: I don't think I've got any further questions.

HEARING EXAMINER: All right, the witness may be excused.

Mr. Bruce?

MR. BRUCE: I have nothing further in the case, Mr. Examiner.

HEARING EXAMINER: Mr. Omar, we'll be glad to hear from you at this time. We'd ask you first to tell us about your qualifications and whether or not you've testified before the OCD before.

MR. STOVALL: Perhaps it would help, Mr. Examiner, if you don't have any objection, I can kind of get Mr. Omar started by asking him that.

Mr. Bruce, do you have any objections?

MR. BRUCE: No, Mr. Stovall.

ED OMAR

the witness herein, having been first duly sworn to testify, testified as follows:

EXAMINATION

BY MR. STOVALL:

Q. Would you please state your name?

A. My name is Ed Omar. I'm an employee of Bravo Operating Company. And for the record, I have testified before -- previously testified before the Oil Conservation Division.

Q. As a petroleum engineer?

A. As a petroleum engineer. I would like -- if you like, I will discuss -- state my qualifications.

HEARING EXAMINER: Go ahead.

MR. STOVALL: I think the Examiner -- having testified before and been qualified, we can accept your qualifications as an engineer. So you can proceed with your direct case, whatever you want to present.

MR. OMAR: As is stated in that letter, we do operate 21 wells in the pool. And my -- our main concern is the fact that the -- that the primary mechanism of the reservoir is the solution gas drive, although it was stated by Mr. O'Rier that they have a gas cap. But I never heard of a gas cap that would produce 250 barrels of oil per day initially.

The way it looks to me is that we have a solution gas drive in that reservoir and when the reservoir reached the bubble point, that's when the GOR increased and the gas volume increased. And as the primary mechanism is the solution gas drive, I would think if we produce the pool at high GOR, the oil recovery is going to suffer mainly because the primary mechanism, recovery mechanism, is solution gas drive.

And, really, what you're doing, you're initiating gas blow-down of the reservoir. We have had basically the same problem on our well, Albert Number 1, in Section 5.

And the way we resolved the problem is by installing a plunger lift, which unloads the liquids, and kept the GOR within reason, within a reasonable rate. And my main objection, as I said, apparently there's a conflict.

Sometimes they're calling it a gas cap, sometimes they're calling it an oil reservoir. And you can't have both cases in the same reservoir. If you have a gas cap, then the well should not produce initially at 250 barrels per day and then decline to 70. I think what happened, you have an oil reservoir, and then when the reservoir pressure dropped from 2,300 pounds down to 900 pounds, within that range, you reached the bubble point and the gas proration increased. And based on what I've heard from them, that's really reinforced my interpretation of the pool, that we do have a solution gas drive rather than a gas cap. And either way you look at it, if you deplete the gas cap or the solution gas drive, then you're going to leave unrecoverable oil reserves. And as we are direct offset operators, we feel like we will suffer.

I don't have anything else to add.

HEARING EXAMINER: Would you like to go ahead through your exhibits and discuss those?

MR. OMAR: Exhibit Number 1, which is just the ownership map, highlighted in yellow, the leases we operate. As you can see, we operate 21 wells in the pool.

And the red dot marks the McCallister Number 4, Cross Timbers. That's just to show the approximate location of the well relative to our wells.

Exhibit Number 2 shows a performance graph of the Albert Number 1, which is one of the direct offset wells. And this is the one I referred to; it had a high GOR, but by the wells flowing -- currently flowing with plunger lift, with the plunger lift. The purpose of the plunger lift is just to unload the oil. In other words, it would help decrease the GOR by lifting more liquid, or oil, in this case.

Exhibit Number 3 is Dewey Number 1, which is also one of our wells. And this is just a graph showing the oil production and the gas production, as you can see. The stairstep is the gas production and the interconnected line is the oil production. As you can see, the gas production and the oil production, where the oil production declined sometime during 1983 and the gas production stayed basically the same. We are not talking about GORs here. We're talking about volumes.

HEARING EXAMINER: Was that the same on the previous graph, the oil is the -- gas is the stairstep on that?

MR. OMAR: Yes, sir, on Exhibit Number 2.

Exhibit Number 4 is the Huey Number 1, which is another well we operate. And it's another offset well to

Cross Timbers McCallister Number 4, and also exhibited the same production characteristics where the oil production declined and the gas production stayed the same.

Exhibit Number 5, which is for the Louie Number 2. It's another well operated by Bravo, and also exhibited the same characteristics which the oil declined and the gas rate basically stayed the same or increased, like in the year 1988 and half of 1989. This exhibit, the purpose of those is just to show that what we have is really a solution gas drive, and if you do not control the gas production from the wells, you're going to leave oil reserve that would not be produced during the primary phase of the production. And based on this, we feel like, you know, if the application is granted, it will not be in the interest of conservation, the prevention of waste and the protection of correlative rights, as it will have a direct effect on us, Bravo Energy, and interest owners in the wells.

I don't have anything else to state.

HEARING EXAMINER: You'd like these admitted into the record?

MR. OMAR: Yes, please.

MR. STOVALL: Before you do that, Mr. Examiner --

Q. (By Mr. Stovall) Who prepared these exhibits?

A. I have prepared the exhibits, except for the production performance graph, which was extracted from

Dewhite's Energy, which is public information.

HEARING EXAMINER: But you did put it on there?

MR. OMAR: Yes, sir.

HEARING EXAMINER: Under your supervision?

MR. OMAR: Yes, sir.

MR. STOVALL: Okay.

HEARING EXAMINER: We'll accept these in the case.

Mr. Bruce.

CROSS-EXAMINATION

BY MR. BRUCE:

Q. Mr. Omar, do any of the wells that Bravo operates have any allowable problems?

A. No, we do not.

Q. And looking at Cross Timbers Exhibit 13 -- I realize those figures are from several months ago -- are those the approximate monthly producing rates for those wells, to the best of your knowledge?

A. I have a copy of the latest C-115 production report. I can compare the two, if you would like; but I cannot answer without referring back to our C-115.

Q. Are many of your wells producing at 15 or 20 barrels a day?

A. Yes, they are.

Q. Like the Albert Number 1?

A. The Albert Number 1, yes; but we had GOR problem

with it, but we resolved the problem by installing a plunger lift.

Q. Was that put on more to maximize oil production than to do away with the GOR problem?

A. It resolved both. It increased the oil production also by increasing the gas production. And maintaining the gas production rate, obviously, you keep the GOR lower because the gas-oil ratio is a function of the two.

MR. BRUCE: I don't have any further questions. I may put one of my witnesses back on for three or four questions.

HEARING EXAMINER: Are any of Bravo's wells completed in this Zone 5 as it was described by Cross Timbers witnesses?

MR. OMAR: Well, I cannot really answer that specific question, but they are completed within the Blinebry zone as defined by the commission vertical limits of the pool. But as far as dividing the reservoir into zones, it is -- we have not done that.

HEARING EXAMINER: The Zone 5 was at the lower portion of that interval that's described as the Nadine Blinebry?

MR. OMAR: Yes.

HEARING EXAMINER: Do you have any wells -- are any of your wells completed in the lower portion of that overall interval?

MR. OMAR: I believe the Albert Number 1 in Section 5 is completed in that zone, but I cannot -- as I said, the -- we are within the -- we are producing within the vertical limits of the reservoir as defined by the Oil Conservation Division. But as far as specifically, I cannot answer that.

HEARING EXAMINER: Cross Timbers' testimony indicated your previous owner of the wells that you operate now had requested GOR relief at an earlier time. Do you know when that was requested?

MR. OMAR: No, I do not know.

HEARING EXAMINER: It's in their exhibits.

MR. OMAR: Yes, I know what you're talking about. Bravo assumed operations of the well in 1986. And, apparently, from what -- apparently that application for increasing the GOR was done prior to 1986.

HEARING EXAMINER: Have you got anything, Bob?

Q. (By Mr. Stovall) You've been asked about whether any wells are completed in Zone 5. You heard the testimony from Cross Timbers' witnesses that they believe that these five zones are really separate reservoirs and not related. Did you hear that testimony?

A. I heard that, and I don't have any problem with that. But that zone could extend or could -- probably is present in our wells. And if it is not present, I cannot

really say that particular zone is present in our wells or not, based on their interpretation.

Q. You don't necessarily disagree then that these could be five separate zones within the pool, that there are as -- that could be separate reservoirs and not interconnected or communications?

A. I agree with that. But, again, really, our objection is the fact that whether they're separate or not, we're still dealing with solution gas drive reservoirs. And by producing excessive gas is going to have adverse effect on the ultimate recovery of the oil phase. And that is really our objection to it. It is not really whether they're separate or not. Zone 5 is within the vertical limits of the pool as defined by the commission rules.

Q. And your concern is then that if Zone 5 were to extend into your wells that they could be withdrawing excessive gas from that?

A. Yes, sir.

Q. The only other question I've got is their testimony with respect to their Exhibit 13 was that none of the wells -- 13 is the tabulation of wells and monthly rates of production which I think Mr. Bruce asked you about, whether you could compare it or not or verify it. And he stated -- or the Cross Timbers witness stated that only the McCallister Number 4 was capable of overproducing the gas

limit because the daily oil rates, even if the GOR was high, the daily oil rates were so low that they could not reach the maximum.

Did I understand you to say that, or my interpretation of your discussion with the Albert Number 1 correct to say that you believe that that well could, in fact, overproduce if you didn't have the plunge lift on it to pull up the liquids without pulling additional gas?

A. That is correct, yes. That is my conclusion.

Q. Are there any other wells that are in a similar situation that would be likewise able to -- faced with the problem of producing higher GORs if you didn't do something to keep the GOR down?

A. No, not that I'm aware of, no.

MR. STOVALL: I have no further questions.

HEARING EXAMINER: You may be excused, Mr. Omar.

MR. BRUCE: I'd like to, if I could, Mr. Examiner, put Mr. O'Rier back on for a few questions.

HEARING EXAMINER: All right, proceed.

Q. (By Mr. Bruce) Mr. O'Rier, did you listen to Mr. Omar's testimony?

A. Yes, I did.

Q. Where he stated there was no gas cap in Zone 5?

A. Yes, I heard that.

Q. What is your opinion of that?

A. Well, we have -- our own production and well records indicate that there is a gas cap in Zone 5.

Q. Are these records the offsets to the McCallister Number 4?

A. Yes, they are.

Q. In your opinion, could the McCallister Number 4 perform as it is with only a solution gas drive?

A. No, I don't see how it could, personally.

Q. Mr. Omar mentioned the plunger lift. In your opinion, is that feasible to put one of those on the McCallister Number 4?

A. We have too high of a pressure for a plunger lift to be applicable on this point. And we -- our individual study of the production history of this particular well indicated that when we first -- just to clarify a point, if I may -- that when we first completed the well, we were in what you would call the nole column. It was just after a period of about a month that we began coning -- you might say we were coning gas in from the gas cap in the McCallister 4.

The rates are such that if you do a study of solution, if you extrapolate what the solution gas drive mechanism would -- what kind of gas rates you would obtain through solution gas drive mechanism, you could not get the rates that we achieved in the McCallister 4. In actuality,

given the pressure that we had, the producing GOR would be somewhere around 1,500 instead of where we're having it, given the pressure draw down.

Q. Now, isn't it true that under your request, by maximizing your oil production, you would also be minimizing you GOR, would you not?

A. That's correct.

Q. And based upon your 568 MCF a day of gas allowable, what would that allowable be per month, gas allowable per month?

A. Excuse me?

Q. You previously testified that the daily allowable was about 568 MCF a day.

A. Correct.

Q. And that works out to somewhere around 17 million a month?

A. Correct.

Q. Did your review of the records show any other wells in the pool that were producing that much gas?

A. No, sir.

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

HEARING EXAMINER: Mr. O'Rier, your belief that there's a gas cap there, do you think that the gas cap was present in your perforated interval in well number 4 at the time you perforated it?

THE WITNESS: At the moment it was perforated, I do not believe the gas cap was present.

HEARING EXAMINER: Where was the gas cap then?

THE WITNESS: If you look at the structure map, we estimate the gas cap was in the -- was probably located at about minus 2670, and we're at 2673. The point being the McCallister 4 happened to be just on the edge of it. It was established through previous testing that the gas cap -- that gas -- that a gas cap was present in the McCallister 1, which is the 40-acre location to the west of McCallister Number 4.

And it was our hope when we completed the McCallister Number 4 that it would be low enough structurally to avoid producing the gas cap. Unfortunately, and for the same reason, that's why we went to McCallister 3, thinking we'd be lower structurally, to avoid producing a gas cap. But, unfortunately, the reservoir is not -- the reservoir is limited to the extent that the oil column with any productive capability to take advantage of any gas cap drive is virtually limited to acreage near our particular well, McCallister Number 4. And that's why we're saying that it's a very limited reservoir in Zone 5 in that in this particular case production from the gas cap will not be harmful to any offset operators, especially since they're not producing out of this particular zone, and since the

zone is not well developed in any locations very well very far away from McCallister Number 4.

HEARING EXAMINER: On the type log, was there any indication -- there was a log that you ran on that well right on top of the structure. Was it the type of a log that would give you an indication that there was gas in that interval?

THE WITNESS: I don't believe that you could tell just from the log.

HEARING EXAMINER: Gamma ray neutron?

THE WITNESS: This is a neutron density log. We have not been able to use these logs to ascertain whether or not a gas cap is present or not. The only way we've been able to determine that is through production testing.

HEARING EXAMINER: How do you explain the -- if you think the high gas production is due to coning, why does it not cone more at the higher rates?

THE WITNESS: Cone more?

HEARING EXAMINER: Why don't you cone more gas -- coning usually is attributable to high rates of production.

THE WITNESS: Let me --

HEARING EXAMINER: Your higher rates -- at the higher rates you produced as well, you showed relatively less gas coning.

THE WITNESS: Let me -- coning is not the appropriate

word. Cusping is the appropriate word.

HEARING EXAMINER: Define that for me.

THE WITNESS: Cusping is where you have a gas cap that is not above you but next to you, and it's close enough -- it happened to be close enough to the McCallister 4 -- in other words, the McCallister 4 was just right on the edge of where the gas cap extended and where the oil column began. And it happened to be close enough to where it was unavoidable to -- it was not possible to avoid producing both -- from both the gas cap and the oil column.

We've been able to define through production testing at least a relative figure as to where that contact occurs, and we believe it's approximately minus 2670, which, if you look at Exhibit 6, is very close to the McCallister 4. And I think that was proven out by the daily production rate plot that was Exhibit 17 in the sense that for a matter of a week you produced at solution gas rates at approximately GOR of around 800.

Yet in a very short period of time, you started producing higher rates, which meant as you drew down the reservoir pressure, the gas cap was encroaching upon you. We believe we just happened to have a location that was close enough to the gas cap, yet was close enough to the oil column to where you could produce both at the same time. Unfortunately, we were unable to find another location in a

down-dip location that would avoid producing the gas cap.

HEARING EXAMINER: Anything further?

MR. STOVALL: No.

HEARING EXAMINER: All right, you can be excused again.

MR. STOVALL: Before we close, Mr. Examiner, I did check -- I did refer to the rule with respect to the notice issue, and Mr. Bruce is correct, regular mail is the required notice for this case.

HEARING EXAMINER: I'd ask you for one other thing; if you'd tabulate the gas and oil production from C-115 reports from the time -- how long has it been since you completed the well?

MR. O'RIER: 4 of '90, so less than a year.

HEARING EXAMINER: Tabulate those for us and send that to us.

MR. O'RIER: The volumes?

HEARING EXAMINER: The volumes.

MR. O'RIER: Monthly volumes?

HEARING EXAMINER: Right.

MR. STOVALL: Just to keep it a clean record, Mr. Bruce, could you attach an affidavit certifying the accuracy of it, and of course, copying Bravo?

MR. BRUCE: Yes, sir.

HEARING EXAMINER: You have anything more to say, Mr. Omar?

MR. OMAR: No, I don't. To me, it doesn't make any difference whether you have solution gas drive or gas cap, you're depleting the primary energy of the reservoir. If you have a gas cap, you are producing a gas cap. If you produce a gas cap, you are depleting the primary energy, and you're damaging the reservoir. If you have solution gas drive, it's the same way, it doesn't make any difference, the way I see it.

HEARING EXAMINER: Mr. Bruce, do you have anything?

MR. BRUCE: The final comment is that they're asking two things here: Number one, to increase the GOR. GOR sought by the applicant isn't unusually high for these Blinebry pools; and, as a matter of fact, there are a number of wells and yet a number of pools overall producing at a higher rate that the 10,000 to 1. And applicant thinks he needs a GOR of approximately 10,000 to 1 to really produce this well properly. And, secondly, on the cancellation of the allowable, based on our testimony, we think the reservoir is limited in extent, and we don't think any offset will be harmed by the cancellation of the overproduction.

HEARING EXAMINER: If there's nothing further, this case --

MR. STOVALL: I think, again, to preserve the record properly, can you get that tabulation within ten days, do

you think? Leave the record open for ten days for the submittal of the additional requested information and at that time take it under advisement.

HEARING EXAMINER: All right, we'll take this under advisement after ten days.

(The foregoing hearing was adjourned at the approximate hour of 12:05 p.m.)

STATE OF NEW MEXICO )

:

COUNTY OF SANTA FE )

I, FREDA DONICA, RPR, a Certified Court Reporter, DO HEREBY CERTIFY that I stenographically reported these proceedings before the Oil Conservation Division; and that the foregoing is a true, complete and accurate transcript of the proceedings of said hearing as appears from my stenographic notes so taken and transcribed under my personal supervision.

I FURTHER CERTIFY that I am not related to nor employed by any of the parties hereto, and have no interest in the outcome hereof.

DATED at Santa Fe, New Mexico, this 19th day of February, 1991.

Freda Donica
Certified Court Reporter
CCR No. 417

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Examiner

Oil Conservation Division