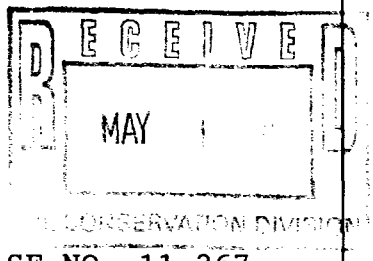
STATE OF NEW MEXICO

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 ARCH PETROLEUM, INC.

CASE NO. 11,267

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: MICHAEL E. STOGNER, Hearing Examiner

April 20th, 1995

Santa Fe, New Mexico

This matter came on for hearing before the Oil Conservation Division on Thursday, April 20th, 1995, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, before Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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I N D E X

April 20th, 1995
Examiner Hearing
CASE NO. 11,267

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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 9:25 a.m.:

EXAMINER STOGNER: At this time I'll call Case Number 11,267.

MR. CARROLL: Application of Arch Petroleum, Inc., for special pool rules, Lea County, New Mexico.

EXAMINER STOGNER: Call for appearances.

MR. CARR: May it please the Examiner, my name is William F. Carr with the Santa Fe law firm Campbell, Carr and Berge.

We represent Arch Petroleum Corporation, and I have two witnesses.

EXAMINER STOGNER: Are there any other appearances?

Will the witnesses please stand to be sworn?

(Thereupon, the witnesses were sworn.)

JACK ERWIN,

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. Jack Erwin.

Q. And where do you reside?

A. In Midland, Texas.

Q. Mr. Erwin, by whom are you employed?

A. By Arch Petroleum, Inc.

Q. And what is your current position with Arch Petroleum, Inc.?

A. I'm a geologist.

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

A. No, I have not.

Q. Could you summarize for Mr. Stogner your educational background?

A. I graduated in December of 1982 from Stephen F. Austin State University with a BS degree in geology.

Q. And since graduation, for whom have you worked?

A. In January of 1983, I went to work for a small independent geologist by the name of Duane Hamilton. In mid-1984 I went to work for Grus Petroleum out of Midland, and in 1988 I went to work for Arch Petroleum.

Q. And since graduation, at all times you have been employed as a petroleum geologist, have you not?

A. That's correct.

Q. And are you familiar with the Application filed in this case on behalf of Arch Petroleum, Inc.?

A. Yes, I am.

Q. And have you made a study of the area surrounding the Justis-Fusselman field?

A. Yes, I have.

MR. CARR: Mr. Stogner, we tender Jack Erwin as an expert witness in petroleum geology.

EXAMINER STOGNER: Jack Erwin is so qualified.

Q. (By Mr. Carr) Mr. Erwin, would you initially summarize what Arch Petroleum seeks in this case?

A. We seek adoption of special pool rules for the Justis-Fusselman Pool, providing for a 10,000-to-1 gas-oil ratio.

Q. By way of background, we ought to advise the Examiner when this pool was originally established.

A. It was established by Order Number R-1143 on March 25, 1958.

Q. And what acreage did this pool originally include?

A. Originally, it comprised only the northwest quarter of Section 24, Township 25 South, Range 37 East.

Q. And that was in 1958?

A. Yes.

Q. The pool was subsequently expanded, was it not?

A. It was. Additional drilling occurred throughout the early Sixties, most of it in 1960, and the pool was expanded during those years.

Q. Was the last expansion in fact in 1960?

A. The last significant expansion. Some wells have

been drilled since to other formations that have been plugged back to the Fusselman. But in general, 1960 was --

Q. And the current pool boundaries were established at that time?

A. Yes.

Q. How many wells are currently producing from this field?

A. Currently there are five producing Fusselman wells in the field.

Q. And the pool is operated under statewide rules?

A. Yes.

Q. And what is the gas-oil ratio?

A. 2000 to 1.

Q. Let's go to what has been marked for identification as Arch Exhibit Number 1, and I would ask you to identify that for the Examiner and then review the information contained on this exhibit.

A. Okay. Exhibit Number 1 is just a blank base map showing the pool -- or the Justis-Fusselman Pool outline, and the leases and various operators of the leases throughout the pool.

Q. And what is Arch's acreage in this area?

A. Arch owns or has lease on the south half of Section 13.

Q. Could you identify for Mr. Stogner the five

current producing wells in the pool?

A. Yes. Well, they're actually marked on another map, but it would be the -- There's two wells in Section 25 in locations H and I, and one well in Section 36 in location A. Then Arch owns two of the producers -- it's the south half of Section 13 -- the Number 9 in location K and the Number 8 in location N.

Q. So we've got two wells on the Arch lease, and then we go down to the southern end of the pool where there are three wells currently producing?

A. That's correct.

Q. Who are the other operators in this pool?

A. Arco and Meridian are the only current operators in the field. Texaco has also produced Fusselman wells in the field.

Q. And after you drilled or recompleted the well that is really the subject of this hearing and discovered you had a good well, did you contact Meridian, Arco and Texaco about this matter?

A. Yes, we contacted all three, and we have had no response from Meridian.

We talked about it briefly with Arco. They've never -- said they'd pass it on to engineering. They never got back to us.

And we contacted Texaco, and they advised us that

they had no objection.

Q. And Texaco is the immediate south offset operator?

A. That's correct.

Q. Okay. Is Exhibit Number 2 a copy of an affidavit confirming that notice of this Application has been provided to Texaco, Meridian and Arco in accordance with OCD rules and regulations?

A. Yes.

Q. Let's move now to what has been marked as Arch Exhibit Number 3. Would you identify that, please?

A. Arch Exhibit Number 3 is a structure map on top of the Fusselman formation.

Q. Now, Mr. Erwin, in reviewing your geological work, would it be easier for you to review both Exhibit Number 3, the structure map, and the subsequent exhibit, the cross-section, at the same time?

A. I think it would, yes.

Q. All right, let's take a minute and take out also the cross-section.

All right, Mr. Erwin, I would like for you to first identify on Exhibit Number 3 the location of the Arch wells in Section 13 --

A. Okay.

Q. -- and working with the trace for the cross-

section that is shown on Exhibit Number 3, review your geological work for Mr. Stogner.

A. Okay. The Learcy McBuffington Number 8 well is in location, then, approximately 330 from the south line and 2300 or possibly 1980 from the west line.

Q. And that's the well that is shown in the sort of center of the yellow-shaded area on the --

A. That's correct.

Q. Okay. The other well that you operate in 13 --

A. -- is due north of it, is the Number 9.

Q. Okay.

A. It's also colored red.

Q. Okay, let's go to the cross-section, and working with these two exhibits could you just review for the Examiner the geology of this field?

A. Okay, the Learcy McBuffington Fusselman field is actually a combination trap, primarily structural, but on the extreme or -- on the eastern edge of the Fusselman reservoir it becomes eroded off.

As you continue to the east, you'll encounter deeper production in the Ellenburger, Simpson and Montoya, but there's no Fusselman reservoir there at all.

As you can see on the cross-section, the base of the Fusselman fairly well conforms to the underlying formations. The top of the Fusselman is an erosional

unconformity surface, which is what my structure map is based on.

As you can see, looking at the cross-section, the Number 8 Learcy McBuffington, the well that we re-entered, was originally drilled in 11 of 1958. On the original completion they made a Montoya well out of that.

Q. That's the second well?

A. That's the second well from the north, yes.

And in 4-66, Gulf re-entered the well, perforated 6696 to 6736 and completed in the Fusselman. The well produced three or four years. They abandoned those perforations and went back to the Montoya.

We bought the Learcy McBuffington lease and the wellbores, associated wellbores, in early 1994.

In 3 of 1995, we re-entered the wellbore, perforated seven holes in the very top of the formation, which was also DST'd on the original drill, had gas to surface in one minute at 15 million a day. They recovered 50 feet of gas-cut mud, and the set of perforations where they had completed in the Fusselman was below that, as you can see on the cross-section.

We perforated our seven holes, we had no activity. We went in the next day with the PPI tool to break down individual sets of perfs.

As we got on bottom with the PPI tool, the well

came in on us. It sat there at about 2 to 2 1/2 million a day.

We left the PPI tool in the hole for the next three to four days, came out after that time period, and on our way out we tested each one of the perfs to see what perfs, if not all of them, were open. As it turns out, only the upper perforation was open, which is colored red on your cross-section. At that time we came out of the hole.

Approximately 14 to 16 days later we acidized the well, and a few days after that we put it on plunger lift.

As you work your way to the south, you can see the Fusselman on the second -- actually on the fourth well south, on the cross-section -- you can see that the Fusselman thins, and on the map you can see it just south of the colored yellow area on your structure map. The Fusselman is beginning to become very thin there, getting close to the erosional limit of the well.

That well was originally drilled in 1958, was plugged back to the Fusselman in 1968, perforated 6647 to 6668. That well made only 10,000 barrels and 40 million cubic feet of gas.

The well -- If you draw your estimated gas-oil contact across, the Texaco C -- or the Texaco Coates C Number 10 well, which is the well south on the cross-

section, should have had or appeared to have had or been in the structural position to have a gas cap.

EXAMINER STOGNER: Okay, now --

THE WITNESS: Okay.

EXAMINER STOGNER: -- the Texaco -- Which Coates well?

THE WITNESS: C Number 10. It should be the fifth well down on the cross-section.

EXAMINER STOGNER: Okay, that's marked Tidewater Oil Company, which --

THE WITNESS: Yes.

EXAMINER STOGNER: Okay. So that's the one you're referring to?

THE WITNESS: That's right. That well was also drilled in 1958. It was actually completed in the Ellenburger, Simpson, Montoya.

And then in 1983 they shot or perforated -- I'm sorry, in 1976 they perforated 6704 to 6750, which is the lower set of perfs on the cross-section.

And then in 1983 they perforated the upper set of perforations, 6584 to 6671. They acidized the upper set of perforations only, with 5000 gallons. The had an increase in water and an increase in oil, and the GOR actually went down, which was surprising to us as we were working through the field. We expected that to be a gas cap well. It has

no appearances of being so. I don't really have a good explanation why it's not.

As you can see, based on the structure map and the cross-section, the well is actually a little high to our well. There is a separation between the two little closed structures in the interior of the field. That may have something to do with it. There may be some sort of internal faults there. And, as evidenced by the Number 5 well just to the north of the Texaco C 10, there may even be some sort of a stratigraphic separation, as indicated by that tight well.

So we feel like, although it's hard to explain logically, that we really have the only gas-cap well, or opportunity to produce gas, in the field.

Q. (By Mr. Carr) Now, as we go on down to the southern portion of the cross-section, are those wells included primarily just for background to show the remainder of the formation?

A. Yes, that's correct. I just wanted to get a real good idea of what the field was doing in its relationship to our well.

Q. Now, this exhibit shows the original oil-water contact?

A. Yes, based off DST and perforations it was fairly easy to come up with an estimated original oil-water

contact, which brings me to my next point.

We perforated the very northernmost well on your cross-section, the Number 9 Learcy McBuffington, in 2 of 1995, which would be perforation 6700 to 6733. That zone was not tested. We thought there could possibly be some attic oil left there.

Perforated the well, acidized it, and it IP'd at 9 barrels of oil 480 barrels of water. So we felt pretty certain that water encroachment had come up to at least that level.

If you look at the set of perforations on the third well north, third well down, you'll see the top perforated interval there, and it's just based upon perforations, is where I have drawn my estimated gas-water contact.

Although we feel like there's some skim oil left in the reservoir, we feel that essentially water is at the gas and may have even encroached a little bit into the original gas-oil contact, but at this point there's very little oil, if any, true oil column left in the reservoir.

Q. Geologically speaking, is your Number 8 well the only well that appears to have the ability in this reservoir to produce the gas that remains in the pool?

A. Yes, there's only two close structures that appear to be high enough to have any gas -- have a gas cap.

One of those has been tested and proven to be oil. The other close structures, if you would call them that, as you continue south through the field, have all been drilled and are all oil, and most of those have been depleted.

Q. Do you have anything else to add to Exhibits Number 3 and 4?

A. No.

Q. Let's go to what has been marked your Exhibit Number 5, the isopach. Will you identify that first and then review this briefly for Mr. Stogner?

A. I created an isopach just to basically back up my structure map to see exactly where my unconformity pinchout was located in the north-south sense throughout the field.

Q. This exhibit basically just confirms the structural interpretation?

A. Yes.

Q. Let's go to Exhibit Number 6. Mr. Erwin, can you first identify this and then explain what this shows about the reservoir?

A. Okay, the five current producers are colored red on your maps. The wells with squares around them are abandoned Fusselman producers with their last date of production directly underneath the square.

Q. And what does this show you?

A. Well, it shows in general, as you begin in a

downdip position, that the wells were watering out in the early Sixties or late Sixties, continued through, and if you kind of trace that back to the structural map, you'll see that the higher wells are actually -- begin to be abandoned in the early Nineties, with the five remaining producers left.

Q. When you look at this, can you actually see the movement of the oil-water contact through the reservoir up the --

A. In general, yes.

Q. And the five producers are structurally high?

A. Yeah, the five producers, if you'll look back at the structure map, are located where they're just getting their last -- remaining amounts of attic oil out of the reservoir. They're all real high water-cut wells.

Q. Is it fair to say that this reservoir is substantially depleted and in its --

A. Yes.

Q. -- the last portion of its life?

A. Yes.

Q. Could you just summarize the geologic conclusions that you've been able to reach from your study of this reservoir?

A. Well, in summary, the field is old, it's a strong water drive. Most of the wells in the field -- of an

original 37 producers, only five are remaining. All 37 had real high water cuts and were abandoned and plugged back to shallower zones. And the field is in the last stages of production.

Q. Do you geologically see some sort of separation between the gas-productive area in the north and the remainder of the --

A. Yes --

Q. -- field?

A. -- structurally and, to some degree, stratigraphically.

Q. Will Arch be calling an engineering witness to review that portion of this case?

A. Yes.

Q. Were Exhibits 1 through 6 either prepared by you or at your direction and under your supervision?

A. Yes.

MR. CARR: At this time, Mr. Stogner, we move into evidence Arch Petroleum, Inc., Exhibits 1 through 6.

EXAMINER STOGNER: Exhibits 1 through 6 will be admitted into evidence.

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

EXAMINATION

BY EXAMINER STOGNER:

Q. Mr. Erwin, on your cross-section you showed the initial oil-water contact. Do you have any idea what the initial -- and I'm assuming that there is a gas-oil contact in the beginning?

A. Yes. There were only a couple of wells in the field that actually DST'd the top of the Fusselman as they were going through it, and recovered only gas. The rest of the wells all flowed oil and mud to surface.

One of those is our Learcy McBuffington Number 8, which you can see the bottom of the DST'd interval.

The other well was the tight well, which is the fourth well from the north. As you can see, it also DST'd, came in at a much lower rate, but recovered only gas.

Now, when they perforated the well, it was an oil well. So I don't know what conclusions you can draw there. But at a minimum, I would put the initial gas-oil contact somewhere below the base of that original DST in the Learcy McBuffington Number 8, at or below that DST.

Q. Okay, I'm looking at the cross-section on the Number 8.

A. Okay.

Q. And where are you showing that DST to be?

A. It should be the top 80 feet or so of the Fusselman. It's a kind of a slanted rectangle.

Q. That -- okay, yeah, that shows the -- That is

showing the DST.

There wasn't any DST information? Oh, here it is.

A. Yes --

Q. I'm sorry, the way I had it folded --

A. 65- --

Q. -- from 6570 to 6670.

A. Yes.

Q. Is that what you have?

A. Uh-huh.

Q. And that corresponds with the little slanted line?

A. Yes.

Q. Now, you're showing that to be a gas-water contact today; is that correct?

A. Well, estimated, yes.

Q. Estimated.

A. Just based off the top of the surrounding perforations.

Q. Showing -- your current producers -- I guess the Number 8 is going to be the well that's going to benefit from this higher GOR?

A. Yes.

Q. Or do you anticipate recompleting one of the other wells up in the north?

A. The only possible well would be the Learcy McBuffington Number 9. And as you can see on the cross-section, we added those perfs already to the top of the reservoir.

And like I said, we had a real high-water-cut well there, 9 barrels of oil and 480 barrels of water. So there's really nothing left to do in the Fusselman on our lease.

The other wellbores that we have in the area are either low and have watered out much earlier, or are east of the pinchout line and are deeper producers.

Q. In your overall study of the area, are there any other Fusselman producing pools in the area?

A. There is the North Justis-Fusselman Pool, which is approximately a mile and a half to the north. If I can remember right, it's in Sections 1 and 2 of the same township and range.

Q. Is it an old pool also?

A. It was discovered approximately the same time. I'm not very familiar with it, other than just in generalities.

Q. Same type of reservoir? Have you been able to determine, or do you know?

A. Well, just mapping through it on a regional sense, it's a structural reservoir. I would assume that

it's, you know, a strong water drive as well. Most of the Fusselman reservoirs in that area and just across the state line in Texas have been. But I can't answer that for sure.

EXAMINER STOGNER: I don't have any other questions of this witness at this time. I may after I hear the reservoir engineer's testimony.

MR. CARR: Okay, Mr. Stogner. Then at this time we would call Mr. Chris Bezner.

EXAMINER STOGNER: I'm sorry?

MR. CARR: Chris Bezner.

EXAMINER STOGNER: Mr. Carr?

CHRIS BEZNER,

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

DIRECT EXAMINATION

BY MR. CARR:

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

A. My name is Chris Bezner.

Q. And where do you reside?

A. In Midland, Texas.

Q. By whom are you employed?

A. Arch Petroleum.

Q. And what is your current position with Arch?

A. I'm an engineer.

Q. Mr. Bezner, have you previously testified before

this Division?

A. No, sir.

Q. Could you summarize for Mr. Stogner your educational background?

A. I graduated from UT Arlington in December of 1981 with a BS in mechanical engineering.

I was employed by Gulf Oil Corporation in 1982 as a petroleum engineer, worked for Gulf Oil for several years, mainly in Hobbs, New Mexico. Chevron took over Gulf in the merger of 1986. I continued working for Chevron for a number of years until September of last year, at which time I went to work for Arch Petroleum as a petroleum engineer.

Q. Are you familiar with the Application filed in this case?

A. Yes, sir.

Q. And are you familiar with the Justis-Fusselman Pool and the wells located therein?

A. Yes, I am.

MR. CARR: Mr. Stogner, I would tender Mr. Bezner as an expert witness in petroleum engineering.

EXAMINER STOGNER: Mr. Bezner is so qualified.

Q. (By Mr. Carr) Mr. Bezner, when did Arch acquire its interest in this pool?

A. In 1994.

Q. And could you just very briefly summarize the efforts made by Arch to develop the acreage?

A. Okay, like I said, we acquired this lease. Basically, we have two wells that are currently productive in the Fusselman, and we have plugged back and worked over both of these wells.

Q. When you worked over the Number 8, what result did you obtain?

A. Like Jack Erwin mentioned earlier, we -- the well came in naturally, flowing gas over 2 million cubic feet a day, which kind of surprised us at the time.

Q. When you discovered you had this kind of a well, what did you do?

A. We immediately contacted the OCD in Hobbs, filed the required C-104 requesting a test allowable. We received a temporary allowable from Mr. Sexton, and we made an Application for this hearing.

Q. Let's go to what has been marked for identification as Arch Exhibit Number 6. These are a number of production plots.

A. Number 7.

Q. I'm sorry, Arch Exhibit Number 7.

A. Yeah. Yeah, Exhibit Number 7 is just a stapled-together series of production plots.

Q. Let's go to the first page of Exhibit Number 7 --

A. Okay.

Q. -- and identify what this is, and then review the information on this page of Exhibit 7.

A. Okay, the first page is a plot of daily well tests from our Learcy McBuffington Number 8, since we recompleted it in March of 1995.

It shows three curves. The attached diamonds are barrels of oil per day, the black squares are barrels of water per day, and then the triangles are MCF per day.

It shows the well completed in the first part of March, as you see, producing up to 2000 -- 2500 MCF per day, flowing, and as Mr. Erwin indicated, out of just the upper set of perfs in the Fusselman.

I'd like to just mention that it shows some tests of water production there. We think that's just load water, you know, that -- when we had to kill the well. It also shows some load oil there that may have been present in the casing before. But generally, it came in as a classic gas-cap well.

It shows a point in the middle of March where we had to shut the well in to change out the packer. It took a few days, a day or two, to get the well back, get it back to flowing like it was, and it started on a decline.

At the end of March, we acidized the well, just to try and clean it up a little bit. The well was down for

a couple of days and came back, again at a lower rate. So this caused us quite a bit of concern. The well was falling off.

And in the middle of April, it shows there, the gas production comes back up, is where we installed the plunger lift system. And we believe that it has helped to unload what little oil has been coming with the gas, basically, to help unload the reservoir. It also brought gas production back up to about 850 MCF per day, which is what it's producing today.

Q. Let's go to the next page of Exhibit Number 7.

A. Okay.

Q. Could you identify that and then review that for Mr. Stogner?

A. Okay, the rest of these plots are Aries plots showing, you know, decline -- It's a decline-curve program, basically showing barrels of oil per day with a decline curve picked through it. It also shows -- And that's the heavy solid line.

The solid line with the little squares are barrels of water per day.

And then the stars with the dashed line is GORs.

The first well shown is our well, the Learcy McBuffington Number 9. Again, it was completed in 1958. And I believe -- What I'm going to show is to tie together

our Learcy McBuffington Number 8 and all the other wells in the field, the downdip wells. They're operating under two different drive mechanisms, basically.

But our Number 8 well is a classic gas-cap, dry-gas well, basically. And all the other wells that are operating under -- as a bottom water drive show a much higher water production and much lower GORs.

I show -- All I show is production data from 1970 on, which is the public data available.

The well by that time had already -- Water production had already increased to the point of increasing up to 200 to 300 barrels of water per day. It shows a steadily declining oil production to its present point at 6 to 7 barrels of oil per day. And as you can see, the GOR fluctuates quite a bit, but as a general rule it stays under 1000.

Also I'd like to point out, on the right side of the plot there are some numbers that are calculated there. These are reserve estimates that the program spits out. And the reason I put those on there is just so it would print the cumulatives of both oil and gas. And so it gives the cumulatives in thousands of barrels of oil and gas in millions of cubic feet.

In all of these plots, I've calculated cumulative GORs. For this particular well, its cumulative GOR is only

800 to 1. So obviously it's producing under a different drive mechanism.

Again, our efforts in this well, in February of 1995, we recompleted to the upper set of perfs -- and I'll be referring to this cross-section throughout -- the upper set of red perfs indicated on the cross-section, trying to get what little attic oil was left, acidized the well.

We brought on maybe a little bit more oil production, but the main thing we did was just bring on more water. The well's making about 480 barrels of water per day and only about 18 MCF. So it's at the oil-water contact. It's also watering out and on its last legs.

Q. And basically, this curve just shows a bottom-water-drive- --

A. Right --

Q. -- type reservoir?

A. -- right.

Q. All right. The next well on the exhibit is the Wimberly Number 2?

A. Right. The Wimberly Number 2, operated by Arco, on the cross-section is the third well from the left. It's the well directly south of us.

And as you can see from this production curve, it also was completed, I believe, in the late Fifties. But by the early Seventies its total production had declined to

the point of being uneconomic.

And as you can see in the cross-section, this is where the zone of interest has already started pinching out of just -- not that much pay there. So the well was abandoned in the Fusselman in 1976.

Again, you can calculate a cumulative GOR, and this calculates out to 2000 to 1.

Q. All right, let's go now to the next well, the Wimberly Number 5.

A. Okay, the Wimberly Number 5 is also operated by Arco. It wasn't completed until 1968.

And again, as you can see on the cross-section, the next well to the right, this is where the porosity really starts pinching out, and it's backed up by its production. Very low production rates.

It was abandoned in June of 1970. I only have a few months of data there.

And also, it only made about 14,000 barrels of oil, 40 million cubic feet. This calculates out to a cumulative GOR of about 3000. Again, a much lower GOR.

Q. Okay, Mr. Bezner, now let's go to the AB Coates C Number 10, the next well --

A. Okay.

Q. -- on the cross-section.

A. The AB Coates C Number 10 is a Texaco-operated

well. It's the well of particular interest, as Mr. Erwin has indicated.

It's structurally maybe even a little bit -- a few feet higher than our well, so you would expect to see evidence of a gas cap in it.

When we went back and reviewed its geologic data and I pulled up the production data to look for an analogy, the first thing that jumps out at you is, this is obviously not connected to our well. It's operating as more of a bottom water drive, even though it wasn't all that good of a bottom-water-drive well.

As Mr. Erwin has indicated before, this well shows the entire production history, because it was completed in 1976. You can see a steadily increasing water production rate, to where the water approaches almost 100 barrels of water per day. Oil production has dropped down to about 10 barrels a day.

And this is when this Coates well was producing out of the lower set of perfs shown on the cross-section, shaded red. They're down in the green section. So obviously the well was watering out, in the last stages of its life.

This is where in 1983 Texaco recompleted the well, added the perfs in the very top of the Fusselman and acidized, and acidized only this upper set of perfs, trying

to bring in whatever was there. If there was any gas present here as a free gas cap, the well should have come in as a flowing gas well, just like ours.

What happened that's surprising is that they gained a little bit of oil production, the water production more than doubles to 200 barrels of water per day, and the GOR actually drops down to 1000. So...

And the GOR stayed pretty constant at 1000 for several years. So there's -- Basically, I can say pretty conclusively, there's no gas cap present in this well.

Q. And what is the current status of this well?

A. The well is currently shut in. You can see from the production plot, it declined down to about 9 barrels of oil, 30 to 40 barrels of water, in which case, in January of 1994, Texaco shut the well in.

Again, calculated from the cums, it produced a cumulative GOR of about 4000 to 1. And basically, like I said, I think this is our best case, showing separation between our well and any other wells in the field, and that this well is obviously producing under a bottom-water-drive mechanism, as opposed to a gas cap.

Q. Okay. Now, Mr. Bezner, we don't need, I don't think, to review each of the following production plots.

Let's skip the next one and go to -- what? The Ida -- two back, the Wimberly Number 5.

A. Right, skip to the Ida Wimberly Number 5 -- it's operated by Arco -- and actually just show it as more of a classic bottom-water-drive oil well. Again, it was completed in 1958.

It shows steadily increasing water production rates until the middle Eighties, water production had peaked out at about 400 to 500 barrels of water per day.

Since the early Seventies, you can see oil going on a steady decline, till it declines down to about 15 barrels of oil per day.

And throughout this time, you can see the GOR fluctuating between 1000- to 2000-to-1 GOR.

This well calculates out to a cumulative GOR of 2000 to 1, and the well was shut in in December of 1993.

Q. Let's go back two pages, now --

A. Okay.

Q. -- and go to the Carlson A Number 2.

A. Okay. I'm going to skip two pages to the Carlson A Number 2. This is the Meridian-operated well. It's also one of the only few active wells in the field.

It's also the best oil well in the field. It recovered over 1 1/2 million barrels of oil. Again, pretty indicative of a classic strong bottom-water-drive oil well.

Increasing water production throughout its life, you can see it increasing up to the point where it even

goes off the scale, in 1990, unfortunately. But I can tell you that currently it's making over 2000 barrels of water per day.

The oil production declines. They apparently increase artificial-lift methods and get production up, but it keeps going back on a decline, where the well has declined down to about 70 or 80 barrels of oil per day.

And the GOR on this particular well, I believe, due to strong pressure support from the bottom water drive, stayed under 1000 to 1. The cumulative GOR for the well calculates out to only 400 to 1.

And again, the high oil cums of this well are pretty indicative. This is what you normally see in a strong bottom-water-drive recovery mechanism: high water cuts, low GORs.

Q. All right, let's move back two pages again to the Arnott Ramsay F Number 8.

A. Okay, the Arnott Ramsay F Number 8 is currently operated by Arco. It was a Chevron well. I'm showing it only because it's one of the only two other active producers in the field that's currently producing.

It also is downdip from our well, shows to be more of a bottom-water-drive oil well.

Water production increased up to a point of about 300 barrels per day, in which case -- I'm not sure what

happened. I think they -- It wasn't economic to produce that much water. But you can see water production declining, oil production also declining to its current rate of about 16 barrels of oil per day.

Throughout most of the life, the GOR fluctuates quite a bit, but it stayed under 1000-to-1 GOR. And again, you calculate the cumulative GOR and this comes out about 900-to-1 cumulative GOR.

Q. Okay, and the next page?

A. The next page is the last active producer in the field. It's kind of hard to read because the water production plot is over the title block there, but it's the State Y Number 8, operated by Arco.

It in the early Seventies was a pretty poor producer. Both water and oil were falling off to the point in 1983 they shut in the Fusselman, and apparently in 1988 went back, recompleted the well or stimulated it, brought it back on.

And all it -- The well came in at about 100 barrels of oil per day, fell off pretty drastically, and brought in a bunch more water. It's producing about 600 barrels of water per day.

The GOR on this well, if you calculate a cumulative GOR, it's only 500 to 1. So just -- It's the only other active producer in the field.

Q. And then the last page in the exhibit is the total production for the pool?

A. Right, the last page shows the total production from the Justis-Fusselman field, with the disclaimer that this is only wells that produced after 1970. Those are the only wells that I could get -- you know, have decline curves for.

And it shows, again, on a total basis, more of a high-water-cut reservoir. Water production by 1970 had increased to the point of about 2000 barrels of water per day, up until 1993, before a lot of the wells got shut in due to the -- They would water out and be shut in. The field was producing at over 3000 barrels of water per day. Water production had declined down to about 100 barrels of oil per day, so it was a high-water-cut, bottom-water-drive field.

Again, from this you look at the cums, calculate a cumulative GOR for the field of 1300 to 1.

So all in all, the entire field, other than our well, is producing high-water-cut, bottom-water-drive reservoir.

Q. Mr. Bezner, could you just summarize for Mr. Stogner why it is that Arch is seeking a 10,000-to-1 gas-oil ratio for this pool?

A. Okay, we're seeking a 10,000 to 1 gas-oil ratio

basically because the current field rules of 2000 to 1 would limit our well. We would either have to shut the well in for most of the month or pinch back on the choke to limit gas production.

Since installing plunger lift, you know, helped to get our gas production back, we've been advised by the manufacturer of the plunger lift that pinching back on the well would not be the proper way of operating. The best way to operate a plunger lift is to allow it to flow as much as possible, to try and keep the well -- any fluids, any oil or water that it accumulates, unloaded, keep the well flowing gas.

Q. If you're required to pinch the well back, is there a potential for permanent loss of reserves?

A. Yes, there is. The main thing that we're worried about -- You know, we've had a couple of cases where we've had to kill the well, and we had quite a time getting the well back. And every time we would kill it, it would come back at a lower gas rate.

So we kind of have the fear that if we ever have to pinch the well in or shut it in to live under the GOR allowable, there will come a point -- fairly soon, I believe -- that we may end up not being able to get the well back, and it will quit flowing gas.

Q. Is the portion of the reservoir we're talking

about here today, in your opinion, rate-sensitive in terms of the gas production?

A. Yeah, it's rate-sensitive, mainly because -- just because we want to keep the well flowing, that if we -- You know, like I said, if we have to pinch it back, increase the back pressure on the reservoir, we have fears of it loading up with water.

Q. If you are able to produce at the rates you're seeking, do you see any potential for reservoir damage?

A. No, sir.

Q. If the Application is granted, in your opinion would hydrocarbons be recovered through more efficient withdrawal than otherwise may be able to ultimately be obtained from this pool?

A. That's right, that's the main thing we're seeking.

We've -- Like I said, throughout all of this I think we've shown that we've discovered a little gas cap in this field, and we're the only ones that are in a position to produce it.

And the only way to produce it is to try and keep the well flowing at a higher gas rate. And all we're going to do is deplete the small gas cap, and it really won't affect anybody else in the field, I believe.

Q. If this Application was denied, in your opinion,

could, in fact, some of the gas be wasted, that is, left in the ground?

A. That's right.

Q. Will the correlative rights, in your opinion, of any other interest owner be adversely affected if this Application is granted?

A. No.

Q. You have contacted all the other operators?

A. That's right.

Q. No objection has been expressed?

A. No objections.

Q. In your opinion, is any other operator in a position where they would have the opportunity to recover this gas?

A. No, they're not.

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

A. Yes, it will.

Q. Was Exhibit Number 7 prepared by you?

A. Yes, it was.

MR. CARR: At this time, Mr. Stogner, we move the admission of Arch Exhibit Number 7.

EXAMINER STOGNER: Arch Exhibit Number 7 will be

any recompletion --

A. No, sir.

Q. -- of any other wells in that gas cap?

A. If you look at our structure map, there's really no other wells capable of being recompleted to try and tap this gas cap, so this is our only opportunity.

Q. If you did a reservoir calculation, estimated life of reserves, how much work would that entail of you?

A. Really, it should be fairly simple. We have the structure map and the isopach. We just planimeter that, you know, take the porosity saturation and make an estimate. I could do that in a few days.

EXAMINER STOGNER: Mr. Carr, I'm going to ask your witness to provide that.

What I've been thinking about in this particular well, it's obvious that this is somewhat of a localized situation, and -- Let me ask you another question, and I'll lead into what I was thinking about here.

Q. (By Examiner Stogner) In the initial phase of the development of this pool, do you think the 2000-to-1 gas-oil ratio was adequate, or do you think at that time it should have been higher?

A. I think in most cases it was adequate. Like I say, you can see from our production curves that most wells were hovering around 2000 to 1.

Q. And this is a last-ditch effort to recover the attic production in this case, the attic gas, in a depleted pool?

A. Right.

EXAMINER STOGNER: Mr. Carr, what I was leading into, as you know, special pool rules goes out one mile further than the pool.

Not that there's that much exploration going on in there, but I think you can see a situation if there was some stepout production and for some oddball reason additional Fusselman production was discovered --

THE WITNESS: Sure --

EXAMINER STOGNER: -- then perhaps the 10,000 to 1 --

THE WITNESS: Definitely --

EXAMINER STOGNER: -- affect that situation --

MR. CARR: Yes, sir.

EXAMINER STOGNER: -- and that's not what we're trying to do here.

MR. CARR: No.

EXAMINER STOGNER: This situation is a conservation of this gas cap --

MR. CARR: Right.

EXAMINER STOGNER: -- and because of the rules, I remember, I think, Arch, you came in and requested

originally a special gas allowable for this one well.

Our procedures just don't allow for that. But at the same time -- It shouldn't detract from it either, but at the same time, it should also make sure that conservation is going on otherwise.

And what I'm visualizing, perhaps, as long as this pool is active, as long as this well is active, or this particular area, then have the 10,000 to 1 for the pool.

But afterwards, after a certain limit, after a certain time, this particular well ceases to produce, then go back, revert back to 2000 to 1 so nobody will be affected, or additional production.

That's what I want to try to incorporate, and I'm going to ask your witness to provide that information for the record --

MR. CARR: Okay.

EXAMINER STOGNER: -- and perhaps, Mr. Carr, if you will help me draft an order that would be adequate for Arch to continue their production uninhibited for the remainder of this gas-cap production, whether it be two, three, ten, whatever, years, and then a smooth acquisition back into the 2000 to 1 so it wouldn't hamper conservation efforts and stepouts, or for anybody to take advantage of the situation.

MR. CARR: Mr. Examiner, would you also be interested in that order providing that it would have no -- there would be no buffer zone or extraterritorial effect of the rule?

EXAMINER STOGNER: I thought about that too. Now, that's something else we can think about.

But if the pool definitely extends down, technical -- or geological, then there's no reason why that additional pool, or whatever the case may be, shouldn't be taken into this pool, because it is one common source of supply, as it has been for the last few years, as we can see by this [indicating Exhibit Number 4].

We could look into that. It might not be a bad idea, because there's no reason why you couldn't extend the pool boundaries as long as there's production. We can look into that.

MR. CARR: Okay. And If I understand you, then you'd like volumetric calculation and a proposed order?

EXAMINER STOGNER: At least you're helping me on those aspects such as that.

This calls for a little bit different situation, I believe. I -- Sometimes those special pool rules that should bound about pool boundaries --

MR. CARR: Uh-huh.

EXAMINER STOGNER: -- tend to get lost --

MR. CARR: Okay.

EXAMINER STOGNER: -- and -- But that's something we can investigate.

MR. CARR: Okay.

EXAMINER STOGNER: So with that, sir, I'd like for you to provide Mr. Carr the additional reservoir information --

THE WITNESS: Certainly.

EXAMINER STOGNER: -- estimates of reserves, even a decline curve, perhaps --

THE WITNESS: Okay.

EXAMINER STOGNER: -- of what we're looking at. That way, we'll have that on the record.

With that, Mr. Carr, I'm going to leave the record open on this case for a sufficient time for your witness to provide that information for us to get an order prepared or a rough draft prepared for the Director.

MR. CARR: Okay.

EXAMINER STOGNER: Anything further in this case?

MR. CARR: Nothing further, Mr. Stogner.

EXAMINER STOGNER: With that, that concludes 11,267.

(Thereupon, these proceedings were concluded at 10:20 a.m.)

* * *

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 April 30th, 1995.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1998

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11267, heard by me on 30 April 1995.

, Examiner
Oil Conservation Division