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:

IN THE MATTER OF CASE NO. 11,089 BEING REOPENED PURSUANT TO THE PROVISIONS OF DIVISION ORDER NO. R-46-A, WHICH ORDER PROMULGATED TEMPORARY SPECIAL POOL RULES AND REGULATIONS FOR THE BARKER DOME-AKAH/UPPER BARKER CREEK, BARKER DOME-DESERT CREEK AND BARKER DOME-ISMAY POOLS IN SAN JUAN COUNTY, NEW MEXICO

CASE NO. 11,089

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

March 20th, 1997

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner, on Thursday, March 20th, 1997, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

* * *

STEVEN T. BRENNER, CCR
(505) 989-9317

I N D E X

March 20th, 1997
Examiner Hearing
CASE NO. 11,089

* * *

E X H I B I T S

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A P P E A R A N C E S

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By: W. THOMAS KELLAHIN

* * *

WHEREUPON, the following proceedings were had at 9:06 a.m.:

EXAMINER CATANACH: At this time we'll call Case Number 11,089.

MR. CARROLL: In the matter of Case Number 11,089 being reopened pursuant to the provisions of Division Order Number R-46-A, which order promulgated temporary special pool rules and regulations for the Barker Dome-Akah/Upper Barker Creek, Barker Dome-Desert Creek and Barker Dome-Ismay Pools in San Juan County, New Mexico.

EXAMINER CATANACH: Call for appearances in this case.

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin and Kellahin, appearing on behalf of the Burlington Resources Oil and Gas Company, and I have one witness to be sworn.

EXAMINER CATANACH: Any additional appearances?

Will the witness please stand to be sworn in at this time?

(Thereupon, the witness was sworn.)

MR. KELLAHIN: Mr. Examiner, there's a locator map behind Exhibit Tab 7. And if you'll take it out of the pocket part you'll see it's a structure map. But for my purposes it also displays for you the current well status. It's got a color code to show you from what pool the well

is being produced, and so that will give you a visual illustration of the current status of the pool.

As you may remember, Burlington is the original Applicant in this case, the only operator in these pools, and has been before you on several occasions to discuss the rules and regulations for the management of these four pools.

The exhibit book is organized in such a way that you have a history of your actions in the Division decisions with regards to these pools.

Mr. Lane is a reservoir engineer, and he has testified before you before. When we segregated the original pool and subdivided it into three additional new pools, he provided the reservoir engineering data. He's here today to update you on the additional wells, the additional information, and we are here in support of a recommendation that these rules now be made permanent.

And as you walk through the exhibit book, you'll find that Exhibit 1 is simply a generalized locator map so that you can find the Barker Dome pools, which you remember are off to the northwest of the San Juan Basin proper.

After that, Exhibit 2, we have provided a copy of the last order issued by the Division. It was a hearing before you in October. The purpose of that order and that application at that time was to bring to your attention the

fact that the Bureau of Land Management's order for this area had some minor differences in nomenclature. As a result of this order being issued, you amended the pool rules to change some of the nomenclature.

We adjusted to make sure that the vertical limits being utilized by the Division were the same as the Bureau of Land Management, and also you approved some nonstandard proration units that exist in the pool.

Exhibit Number 3 is R-46-A, and that is the order issued by the Division based upon a hearing before you as the Examiner back in November of 1994, and this was the order that subdivided the original Barker Creek-Paradox-Pennsylvanian Pool so that we now have four pools.

Exhibit Number 4 are the findings from the Colorado Oil Conservation Commission with regards to the management of these reservoirs on the Colorado side of the boundary.

Then Exhibit 5 is a copy of the Bureau of Land Management order. It's Order UMU-1.

And then after that, Exhibit 6 is a chronology from our records and the Division records with regards to the action taken from November of 1994 through March of 1997.

And then Exhibit 7 is the map that you're looking at, it's the structure map, and it's at that point in the

exhibit book that I would like to begin my discussion with Mr. Lane.

CHIP LANE,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. For the record, sir, would you state your name and occupation?

A. Yes, sir, my name is Chip Lane. I'm a senior staff engineer with Burlington Resources.

Q. On prior occasions have you testified and qualified before the Division as an expert petroleum engineer?

A. Yes, sir, I have.

Q. Have you continued to be involved in the reservoir and petroleum engineering aspects with regards to production and wells in all four of these pools?

A. Yes, I have.

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

EXAMINER CATANACH: He is so qualified.

Q. (By Mr. Kellahin) Let's take the locator map, Exhibit 7, and have you show us which of the new wells that have been drilled since you last made a presentation before

Examiner Catanach -- I see the wells are coded by color, and within the color is a number. I assume that's the well number?

A. Yes, sir, the wells are color-coded with respect to the formation they're completed in, and the number located inside the circle is the well number.

Q. All right. Let's find a section, and then within a section find me the well number for all the new wells, and start anywhere you like.

A. Okay, let's look at Section 20 --

Q. Okay.

A. -- 32 North, 14 West. In the northwest quarter of that section you'll see the Ute 24 well, surrounded by a blue colored dot, and it is a Desert Creek completion.

Q. That's a new well?

A. Yes, sir.

Q. All right.

A. Down to the south of that, you'll see the Ute Mountain Ute Number 40, with a multiple colored dot. And that well was drilled in 1996. It's also a new well.

The Section 19 to the west of Section 20, the Ute Com 23 and the Ute Com 25 are both new wells that have been completed in the Desert Creek.

Section 30, to the south of Section 19, the Ute Mountain Ute 41 and the Ute Mountain Ute 42, which is in

the southwest quarter of that section.

Q. It doesn't have a number on it, but that's the 42?

A. Yes, sir, it's in there faint. It's just kind of hard to see.

Q. Okay.

A. Both of those are new wells, drilled last year.

Up to the north in Section 17 the Ute 22, which is in the northeast quarter, is a new well. The Ute 6 to the southwest is an old well.

To the east in Section 16, the Ute 27 is a new well.

And up into the Colorado side, in Sections 21, the partial section is Section 24, the 9A and the 19 are new wells.

In Section 15 to the northeast, the Ute 30 is a new well.

And I think that covers all the new wells.

Q. Have you seen any information from the new wells --

A. Yes, sir.

Q. -- to cause you to change your conclusion on any aspect of the pool rules that you had made prior to having that information?

A. No, sir, we haven't.

Q. So all the new information is consistent with your prior conclusions about well spacing?

A. Yes, it is.

Q. To refresh the Examiner's recollection, what is the spacing for the various pools, starting with the lowest pool?

A. The lowest pool is the lower Barker Creek Alkali Gulch Pool, and that was the original pool that the field was discovered and developed on, and that is still spaced at 640 acres. And we defended that last time with a showing of the interference between the Ute 12 and the Ute 14 wells, which the decline curves are in Exhibit 7.

Q. Okay.

A. The upper Barker Creek-Akah zone is spaced on 320 acres, the Desert Creek is spaced on 320 acres, and the Ismay is spaced on 160 acres.

Q. All right, let's start, then, with the rest of the documents contained behind Exhibit Tab Number 7, if you'll flip behind the pocket, and let's identify and describe the displays for the Examiner.

A. Yes, sir. The first display in Exhibit 7, behind the map pocket, is just a summary of the pressure information we've collected. The spreadsheet is identical to the original spreadsheet presented in the first case, with the addition of the pressures from the new wells that

we've gained down at the bottom, starting with the Ute 24 well.

So of interest in this spreadsheet is primarily the Ute Mountain Ute Number 41, which was a DST, which was one of the new Desert Creek wells, and it happens to offset the 24, the 23, the 25 and the 40, some of the better wells in the field, and it came in at an original pressure of 3500 pounds, and that basically gives us an indication that we're not seeing drainage across that spacing.

Q. Now, this is the Desert Creek, we're on 320?

A. Yes, sir.

Q. The 41 well continues to honor the 320 spacing?

A. Yes, sir.

Q. And we have found that that appears to be appropriate at this time, because you have original pressure in the subsequent well?

A. Yes, sir.

Q. Now, do you have a drill stem test attached in the book? I saw one, for the 41 well?

A. It's in Exhibit 10.

Q. Okay, Exhibit 10 is a drill stem test for the 41 well?

A. Yes, sir, and then also some other pressure transient tests.

Q. Okay.

A. The Ute Com 23 and the Ute Com 27 wells, the pressures of 3075 pounds and 2595 pounds, those are the pressures from a pressure transient analysis, and I've included them in here because we did run them. I think that they're low compared to what the reservoir pressure is, and I've included the pressure transient analysis report from that.

The reason I feel they're low is because the permeability in each one of those zones is, I think, .03 millidarcies and .014 millidarcies, and they didn't have sufficient time to build up to be indicative of what the true reservoir pressure was.

The next two exhibits are the Ute 12 and the Ute 14 decline curve analysis, and across the -- or up the X axis is the production rates, across the Y axis -- or, I'm sorry, up the Y axis is the production rates; across the X axis is the time.

And again, these two wells are in the lower Barker Creek zone, spaced on 640 acres.

Q. Now, this was information you showed Examiner Catanach at the prior hearing?

A. Yes, sir.

Q. And these are the two wells that when you recompleted -- I forgot which one was recompleted.

A. We recompleted the 12.

Q. Which you recompleted, the 12, then you show a dramatic production decline in the 14?

A. Yes, sir.

Q. And that's shown on the last display here?

A. Yes, sir. And we included it just to show that it's continuous, or it has continued and it's not a -- it wasn't a temporary bobble or anything in the production.

Q. And that was the interference data used to continue the justification of 640 spacing for the deepest of the four reservoirs --

A. Yes, sir.

Q. -- or pools?

All right. And you've seen no change in that decline, and therefore these wells are still interfering with each other, if you will?

A. Yes, sir.

Q. All right. Behind Exhibit Tab 8, let's start the next chapter and have you identify and describe that information.

A. Yes, sir, Exhibit Tab 8, the exhibits presented in that area are the same if not similar to the original exhibits, specifically the original wells used to determine the drainage area for the Ismay and the Desert Creek zones, and what we've done is just updated the production and re-examined the drainage areas on each one of those.

Q. The spreadsheet for the Desert Creek, that's the 320 pool?

A. Yes, sir.

Q. And you continue to calculate that, at least for this well, your drainage area approaches the 320-acre spacing?

A. Yes, sir, it does.

Q. All right. What's behind that tab?

A. Behind that is the decline curve that we forecasted the EUR from, for that well.

Q. Okay. Let's turn to the next display, and we're looking at the Ismay formation, which is the shallowest of the pools?

A. Yes, sir, and this is again the Ute Number 16, and this is the well originally used. The difference in this one is, the production curve has been updated to show the current production, and the drainage area has been calculated to be almost 30 acres.

Q. The next set is the Ute 24, and we're back down in the Desert Creek?

A. Yes, sir, we're at the Desert Creek, and we included this one because this is by far the best Desert Creek well out there. And you see the drainage area calculated on this well is 324 acres. EUR of 9.7 Bs. And the attached decline curve follows.

Q. That continues, then, to support your earlier conclusions about spacing in the Desert Creek of 320 being appropriate?

A. Yes, sir.

Q. Let's turn to the next chapter. It's behind Exhibit 9. Identify and describe for us the information behind Exhibit Tab Number 9.

A. Yes, sir, this is a summary of the new wells drilled in the Desert Creek, and basically what the table is, is a summary of the longer version presented in the previous exhibits.

And this includes the summary and the spreadsheet, and then following that summary there are the decline curves for each one of the wells presented herein. That indicates the EUR on the summarized spreadsheet.

The Ute 22, Ute Mountain Ute 40, 41 and 42 at the bottom, don't have sufficient production history to have a good estimate of the EUR, so we did not include those.

Q. Mr. Lane, are you still satisfied, based upon this new information, that the conclusions and opinions you expressed back in November of 1994 about subdividing the Pennsylvanian into these four pools was an appropriate decision?

A. Yes, sir.

Q. Are you still satisfied that your conclusions

about well spacing that are applicable in each of these four pools is still the appropriate spacing?

A. Yes, sir.

Q. Would you recommend to the Examiner at this time that these rules be made permanent?

A. Yes, sir, I would.

Q. Do you see any reason for modification, amendment or other changes to the rules as we now have them in Order R-46-B?

A. No, sir.

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

We move the introduction of Burlington's Exhibits 1 through 10.

EXAMINER CATANACH: Exhibits 1 through 10 will be admitted as evidence.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Lane, how many wells are currently completed in the Ismay formation?

A. There's nine wells currently completed in it.

Q. Nine wells?

A. Yes, sir, including wells that have been commingled in it.

Q. Okay. If I understand correctly, you've done a

volumetric analysis and decline curve on the Ute Number 16 --

A. Yes, sir.

Q. -- which is located --

A. -- in Section 22, just north of the New Mexico state line, where it says "type log", the arrow.

Q. Have you done any analysis for any additional wells in the Ismay formation?

A. Yes, I have.

Q. These aren't presented as evidence?

A. No, sir, my findings weren't anything significantly different than this.

Q. You essentially found small drainage areas for the other Ismay wells?

A. Yes, sir.

Q. Approximately the same as this one --

A. Yes, sir.

Q. -- 29 acres?

What do you attribute the small drainage areas to? Is that low permeability or --

A. Low permeability. We're not seeing any pressure drainage or anything like that from one well to the next in any of the zones that we've drilled, but the Ismay isn't as dolomitized, and so you don't have as much developed porosity or permeability, and so it's just tighter.

Q. Does Burlington have any plans at this point to infill drill any of these 160-acre proration units in the Ismay?

A. By themselves?

Q. To drill an additional second well, maybe, in an existing 160? I don't know, or in a combination of -- with something else?

A. I'm sorry, I don't understand.

Q. You're only -- Your evidence indicates that these wells are draining small areas, that they're probably not draining the entire 160 --

A. Oh, no, we don't --

Q. -- is that correct?

A. -- not within the 160.

Q. You don't plan -- The reserves aren't sufficient to drill additional infill wells?

A. No, sir.

Q. Do you know what the largest drainage area you've encountered in the Ismay would be, Mr. Lane?

A. I'd say it's going to be pretty close to the 30 acres on the 16.

Q. Why do we need to space this on 160 if it's draining 30 acres?

A. It's consistent with what we've had in the past, and there is the potential that it could be greater than

the 30 acres and up to 160.

Q. Have you seen any evidence to that effect?

A. No, sir.

Q. Is there much additional drilling in the Ismay -- Are you going to drill additional wells to the Ismay?

A. We'll drill wells and complete them in the Ismay, but they'll be in conjunction with other zones. The economics just aren't -- or the volumes just aren't there to support the cost of a drill well.

Q. As I understand from, I think, previous testimony you guys presented, this is all owned entirely, 100 percent, by Burlington; is that correct? Or is there --

A. I think it is, I'm pretty sure it is. There's only one well to the far north that is operated by someone else, and I'm not sure if it was included in the original field or not. I don't think it was. In the Ute Mountain Ute zone, all of the royalties.

Q. Okay. As far as the -- Let's see, we're looking at the upper Barker Creek-Akah. What did you guys present with regards to those?

A. We don't have any new information on either one of those zones. We've recompleted -- or completed the 40 and the 42 into those zones, and those are the only ones, and we don't have any information on those.

Q. So you've got three wells completed in that

formation?

A. Uh-huh, the 22, the 40 and the 42.

Q. And two of those are new?

A. All three of them are new.

Q. All three are new?

A. Yes, sir.

Q. What did we initially -- Do you remember what we used to initially space them on 320? Did we not have any data at the previous hearing?

A. We didn't have any engineering data. We spaced on the 320 based on the geologic interpretation that it was a similar reservoir quality and style as the Desert Creek well was, and it was dissimilar from the lower Barker Creek-Alkali Gulch in that it didn't appear to have the porosity or the permeability that the lower Barker Creek did, and so we spaced it to the 320 because it appears similar to the Desert Creek.

Q. Okay, the Desert Creek. And you've got volumetrics and decline curves on the 2R?

A. Yes, sir, we've got them on the 2R, and I think at the end of that section, section 8, or Exhibit 8, the Ute 24 is by far the best Desert Creek well out there, and we included that because we felt that would be the high side of the drainage areas.

And also in Exhibit 10, you'll see that the

pressure transient analysis from that well is included. And I want to say -- it's the very last one -- that the permeability is 3.5 millidarcies, compared to the permeability of the other ones, which were, I think, in the .03- to .01-millidarcy range, the other ones being the 23 and the 25.

So it's the -- It should have the largest, and does have the largest, drainage area in the Desert Creek out there.

Q. Okay, you're talking about the -- ?

A. The 24.

Q. The 24.

A. And you look at the decline curve and it's a pretty reasonable forecast, based on that decline curve, on that well.

And you're also looking at production history from, I think, September of 1994, so it's had a pretty good run.

Q. Where is the 2R?

A. The 2R is located up in Colorado, in Section 15, north of the -- north of the 16 well.

Q. Okay. That's got a pretty good drainage area too?

A. Yes, it does.

Q. Have you looked at any other Desert Creek wells?

A. I've looked at all of them. They're all summarized on the -- What's that? Exhibit 9, at the very beginning.

Q. Okay. You had some substantial differences in drainage areas there. It's all due to differences in permeability?

A. Yes, sir. And there is a substantial difference. And a lot of that is caused by just the heterogeneity of carbonates.

Q. What do you attribute -- How do you account for those differences in permeability?

A. It basically has to do with -- In the Desert Creek, it's a dolomitized limestone.

And just to kind of summarize the geologic presentation, this is an anticlinal structure, and what you'll see if you look at the Desert Creek wells, the blue ones, you'll see that they're kind of in a band on the side of the structure. And what has happened is that you've had water percolate through the limestone, replace the calcium with magnesium, convert it into dolomite. And in this process, it's not a uniform process, and you develop permeability streaks or porosity streaks.

And the other thing too, if you look at core analysis you'll see there's a pretty good relationship between the porosity and the permeability, with a small

increase in the porosity at a level of, say, you know, 15 to 16 percent. It has a drastic change in the permeability.

So essentially where you're getting high porosity streaks, you're also getting the high permeability, which is adding the variability to the drainage areas.

Q. So basically you've only got two wells out of seven or eight that can drain the 320-acre proration unit --

A. Yes, sir.

Q. -- for the most part? The rest will be draining less than a 160.

Was there -- I can't recall, was there some -- in the -- when we first established these rules, was there some economic reasons why we went to the bigger spacing? I mean, do you need larger proration units to drill these wells or --

A. We went to the 320-acre spacing because -- We presented the Ute 2R at that time, and I think the original drainage area of that was around 290 or 296 acres, in that ballpark. And we felt that was appropriate.

You know, the Desert Creek wells with the small drainage area, quite frankly, are uneconomic.

Q. I'm sorry, they're uneconomic?

A. Uneconomic.

Q. Are wells such as the 19 and the 9A, are those economic?

A. Yes, they are.

Q. So your recommendation is to leave the spacing the same in all these formations as has been established?

A. Yes, sir.

Q. Even though the science may not show that that should be the case?

A. Well, I guess the science -- just paraphrase. The science is showing that the drainage areas are smaller than the rules indicate in some cases. But the economics show that if the reserves are that small, they're not feasible to drill for anyway.

Q. Would it be -- Since we don't have, really, any production information in the upper Barker Creek, would it be a benefit, maybe, to re-examine that in a period of time, when you do have some production history?

A. We could. I would be very surprised if it's going to be anything different than the Desert Creek, and that's just -- if -- We've tested in a few wells, and if we had seen anything that was as good as the 24 or the 2R or one of the better wells, we would have drilled for it as an original target by itself.

Q. Are you saying that the three new Barker Creek wells that you've drilled look more like the poorer wells

that you've drilled in the Desert Creek?

A. Yes, sir.

EXAMINER CATANACH: I think that's all I have, Mr. Kellahin. Do you have anything further in this case?

MR. KELLAHIN: No, sir.

EXAMINER CATANACH: There being nothing further, Case 11,089 will be taken under advisement.

(Thereupon, these proceedings were concluded at 9:44 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11089, heard by me on March 20 1997.

David R. Catanach, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

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

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

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

WITNESS MY HAND AND SEAL March 27th, 1997.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1998