STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BLDG.
SANTA FE, NEW MEXICO

19 November 1986

EXAMINER HEARING

IN THE MATTER OF:

Application of Meridian Oil, Inc., for special pool rules, Lea County, New Mexico. CASE 9037

BEFORE: David R. Catanach, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Division: Jeff Taylor
Attorney at Law
Legal Counsel to the Division
State Land Office Bldg.
Santa Fe, New Mexico 87501

For the Applicant: W. Thomas Kellahin
Attorney at Law
KELLAHIN, KELLAHIN, & AUBREY
P. O. Box 2265
Santa Fe, New Mexico 98501

I N D E X

E X H I B I T S

MR. CATANACH: Call next Case Number 9037.

MR. TAYLOR: The application of Meridian Oil Incorporated for special pool rules, Lea County, New Mexico.

MR. CATANACH: Are there appearances in this case?

MR. KELLAHIN: If the Examiner please, I am Tom Kellahin of Santa Fe, New Mexico, appearing on behalf of the applicant, and I have two witnesses to be sworn.

MR. CATANACH: Are there other apeparances in this case?

MR. NUTTER: Dan Nutter appearing on behalf of Bass Enterprises Production Company.

MR. CATANACH: Anybody else? Will the two witnesses please stand and be sworn in?

(Witnesses sworn.)

GENE R. CARLSON,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Carlson, for the record would you please state your name and occupation?

A My name is Gene Carlson. I'm a petroleum reservoir engineer for Meridian Oil out of Midland, Texas.

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

A Yes, I have.

Q And pursuant to your employment by Meridian Oil Company have you made a study of certain of the engineering and economic factors that surround Meridian's request for special pool rules in the Airstrip-Bone Spring Pool, Lea County, New Mexico?

A Yes, I have.

MR. KELLAHIN: We tender Mr. Carlson as an expert petroleum engineer.

MR. CATANACH: Mr. Carlson is so qualified.

Q Mr. Carlson, let me direct your attention, sir, first of all, to Exhibit Number One, and have you identify that exhibit for us.

A Exhibit Number One is a carbonate net porosity Isopach of the Third Bone Spring interval, which produces predominantly in the north part of the Airstrip-Bone Spring Pool, which you can see is shaded with yellow shading, the entirety of the Airstrip-Bone Spring Pool.

The Third Bone Spring sand is a sub-member of the overall interval that is prorated as the Airstrip-Bone Spring Pool, and as I said, the predominant production is from the north end of the pool.

The Third Bone Spring sand producers are highlighted by an even darker orange shading and, as you can see, there are two in the north end of the field and four in the south end of the field.

Current status of those wells is that the two in the north end of the field are prolific producers while the south end of the field is marginal production and in fact only the southwesternmost of the Third Bone Spring producers is currently producing oil.

Q The Airstrip-Bone Spring Pool is on statewide rules, is it not?

A Yes, it is.

Q And it was historically developed on 40-acre spacing?

A Yes, sir. Actually we've had two stages of development in this field.

The south end of the field, which, as I will point out later in the presentation, produces primarily from the Second Bone Spring sand and carbonate interval, was originally drilled in the time frame of 1979 and 1980 through 1984.

There were originally two Bone Spring pools in that area; the Upper and Lower Bone Spring were prorated separately and in July of 1984 the field rules were combined or the fields were combined and there is now only one pool and that is the Airstrip-Bone Spring Pool.

Development continued in the area and I don't have a lot of history in the south end of the field, but in the north end of the field the wells were drilled in 1984 through 1985 time frame and at that time, at the initial drilling of the No. 15-1, which resides in the southeast -- in the northeast of the southeast quarter of Section 15, Township 18 South, Range 34 East, we requested that special field rules be set up for these -- for the north end of the field, which, as I say, produces from a different interval, actually, than the south, primarily.

At that time the Airstrip-Bone Spring Pool encompassed up to the south half of Section 23, just south of Sections 14 and 15, and at that time the Commission, and we're unclear because of the merger of two companies, but at that time we could not derive this informa

tion -- at that time the Commission either formally or informally rejected forming special field rules because of the proximity of the then prorated Air Strip-Bone Spring Field to our production that we had just recently drilled. And so our production was brought into this field.

Q Has the Commission made any segregation of the various members of the Bone Spring and isolated them out as separate pools?

A They did originally but back in July of 1984, as I believe I mentioned before, they commingled the Upper and Lower Bone Spring Pool, with respect to the Airstrip Field area.

Q Why don't you give Mr. Catanach a summary of what you propose to accomplish with this particular application, Mr. Carlson?

A Well, because of the widely variant producing characteristics of the Bone Spring, the very large Bone Spring interval in this area, we believe that the -- the operators need the flexibility to do what is appropriate as they find the Bone Spring to be productive in this area.

We have what we believe to be here a debris flow depositional environment, which causes, as I've mentioned before, widely variant producing characteristics.

In some areas of the field you may find that wells drain even more than 80 acres and in some areas

of the field they may drain less than 80 acres and on the range of 40 acres, but we do need the flexibility to do what's right to encourage development in an orderly fashion.

Q Let's have you turn to Exhibits Two and Three which are the type logs and have you identify and describe those exhibits.

A Okay. The two type logs that we present here, and these are type logs from the north end of the field, being the Tonto 14 Com No. 1 is the well that is in the northwest quarter of the southwest quarter of Section 14 of the township, and the Amoco No. 1 State "FU" is the northeast quarter of the southwest quarter of Section 25 in the south end of the field.

These, I propose to be typical producers, or typical logs from the north and the south end of the field.

As you can see marked on those logs, we have marked the perforated intervals in various fashions.

On the Tonto State 14 Com No. 1 the productive interval you can see that the square inside the depth scale to be within the Third Bone Spring carbonate interval. The Tonto 14 Com No. 1 is therefore what would have been a Lower Bone Spring producer in the -- in the previous field rule designation.

However, the No. 1 State "FU" Amoco Well

in the south end of the field in the previously specified location produces from a not too dissimilar depth interval; however, it is producing from -- stratigraphically from the Second Bone Spring carbonate interval, which is in the upper part of the field, or upper part of the overall Bone Spring interval.

Q If the Commission desires to continue the current order of treating this whole area as one common pool for purposes of establishing rules, do you have some recommendations to the examiner as to how he might handle the existence of wells that are currently dedicated to 40-acre tracts?

A Yes. I think that as a matter of convenience of the Commission and existing operators, and since the current proration unit certificate for each of the existing wells in the 40-acre area do say 40 acres, even though they would be exceptions, it would be my suggestion that those operators not be required to file any exception notices for -- for acreage, because there -- we're not changing those wells' density. They are exceptions but their spacing or their proration units will not change in shape or size.

Q How would you recommend the examiner handle the question of establishing allowables for wells on 40 acres and wells that select or exercise the option to be

spaced upon 80-acre spacing units?

A Well, even though there are no 40-acre wells, or wells that would be 40-acre wells, that would produce anywhere near even the statewide 40-acre allowable, since we are treating this as -- for a matter of -- because it's so dissimilar in production, we would suggest that -- that operators that choose to put their wells on 40-acre allowables not have to split the 80-acre allowable but be allowed the full 40-acre allowable, if they -- if they desire.

Q For this approximate depth bracket, what are we talking about in terms of barrels of oil a day on a 40-acre unit?

A For a 40-acre unit it would be 275 barrels a day while on a -- while on an 80-acre unit it would be approximately 355 barrels a day.

Q Is there any potential problem with regards to how the gas/oil ratios are handled for the wells in the pool?

A No, as a matter of fact, as I mentioned before, most of the wells that would be in the 40-acre area are very low oil producers and also the average, I would say, eyeballing the average of the gas/oil ratios for all the wells in the field, we're talking less than 1000 average GOR, and I believe the highest GOR well that I had information on was about 3000 GOR but it was from a 35-barrel a day oil well.

So I don't think that there would be any penalties incurred by anyone or any inconveniences caused by the gas/oil ratio of 2000.

Q Let me show you, Mr. Carlson, what we have marked as Exhibit Number Eight, and we'll take this exhibit out of turn at this time.

MR. KELLAHIN: Exhibit Number Eight, Mr. Examiner, represents a rough draft of a proposed order in which Mr. Carlson and I have attempted to put in words the concept of how to handle the special rules.

You'll have to excuse us, there are some typographical errors. We've referenced Bone Springs, plural, and it should be singular, and I believe later on the exhibit there may have been a reference to Wolfcamp production when in fact it should have been Bone Spring production.

Other than that I think the -- the proposed order is correct.

Q Mr. Carlson, would you take a minute and identify for Mr. Catanach where we have attempted to locate the type of rules that would implement the suggestions you've made to him this morning?

A Okay. On the third page of the proposed order we find Rule No. 1, which specifies that this will encompass the same area as the current Airstrip-Bone Spring

Pool, or any well completed in the Bone Spring, and in here in this rule, the Wolfcamp word appears twice. It should be Bone Spring. And that this would be -- this rule would encompass the current Airstrip-Bone Spring Pool and any well completed in the Bone Spring formation within a mile thereof.

And then we specify in Rule 2 that each well shall be located on a standard unit containing 80 acres more or less, consisting of the north half, south half, east half, or west half of a governmental quarter section; however, nothing contained in this order shall be construed as prohibiting the drilling of a well on each of the quarter quarter sections in the unit, hence 40-acre spacing would be allowed.

Q So under the second portion of proposed Rule 2, that gives us the flexibility and the option to have the operator select either the 80 or the 40.

A That's right.

Q All right. As we move through the rules, let's have you identify for us how you'll handle the grandfathering, if you will, --

A Okay.

Q -- of the existing 40-acre wells.

A I believe it's this Rule 5 right here.

Q Yes, sir.

A Okay. The Division Director may grant an exception to the requirements of Rule 4 without a hearing when application has been filed for an unorthodox location necessitated by topographical conditions or the recompletion of a well previously drilled to another horizon.

All operators offsetting a proposed location shall be notified by registered or certified mail and the application shall state that such notice has been (unclear).

The Director may approve the application upon receipt of written waivers from all operators offsetting a proposed location, or if no objection -- excuse me, this is not the grandfathering --

Q I -- I directed you to the wrong one. It is on the last page and it is --

A It's on the last page in --

Q -- paragraph two.

A -- Item 2.

Q Yes, sir.

A I'm sorry. I thought it was on the other page. I'm sorry to confuse the issue.

All right. In here effectively we've attempted to grandfather all of the existing 40-acre wells without a requirement of paperwork, and in fact the paperwork requirement will be for the -- for the 80-acre wells.

Pursuant to Paragraph A of Section 70-2-18 contained in Chapter 271, any wells completed after December 1st, 1986, in the Airstrip-Bone Spring Pool shall have dedicated thereto 80 acres in accordance with the foregoing proposed rules.

So we're only talking about this coming into effect for wells completed after December 31st -- or 1st, excuse me.

Or, pursuant to Paragraph C of said Section 70-2-18, existing wells shall automatically be approved as 40-acre nonstandard spacing or proration units unless the operator files a new Form C-102 with the Division dedicating 80 acres to the existing well within sixty days from the date of this order.

I'm sorry I cause the confusion.

Q That was at least our attempt to draft language that would grandfather in the existing wells, maintain the status quo on the allowables for those 40-acre wells, and to give the flexibility and option to subsequent development on 80 acres.

A That's right.

Q Let's go now, sir, to an economic analysis that you have made with regards to the drilling and spacing of wells, and let me ask you to direct your attention now to what is marked as Exhibit Number Four.

Will you identify and describe that exhibit for us?

A Okay. Exhibit Number Four is an economic analysis with respect to the Airstrip-Bone Spring Field.

Q Just a minute. We don't have it together yet.

The Examiner's copy of that exhibit is identified, I think, as Exhibit Number Two, and we are referencing it as Exhibit Number Four.

All right, please continue.

A Okay. The Airstrip-Bone Spring Field under 40-acre -- the Airstrip Bone Spring Field under 40-acre and 80-acre spacing is analyzed here as to the economic outcome for an operator based upon some other work which will be presented later in the testimony supporting the fact that an 80-acre well in the Airstrip-Bone Spring with recoveries of 140,000 barrels and 47.1-million cubic feet, would be an economical proposition on 80 acres, yet would not be so on 40-acre spacing.

The -- this is demonstrated in the economic parameters and reserve parameters listed on the economic analysis exhibit.

As you can see, for a 100 percent working interest and an 87-1/2 net interest the net reserves resulting from approximately 140,000-barrel and 50-million

cubic foot well would be 120,000 barrels and 40-million cubic feet, approximately.

The working interest investment required to drill this well by our current estimates is $539,000, approximately.

Scheduling this production at an initial production rate of 230 barrels a day, an average initial potential for a well in this area, and using oil prices of $15.00 per barrel held flat for three years and then escalated at 4 percent with no cap, and a gas price of $1.50 per Mcf held constant through the same period and escalated at 4 percent, the payout for this proposal on 80-acre spacing would occur in 2.4 years.

An after tax rate of return would be generated of approximately 40 percent; profit to investment ratio at 15 percent would result in .49, with resulting present value at 15 percent of $263,000.

In brief summary this is a very attractive economic venture and would withstand the risk of oil and gas opportunities that we have in this area and we would certainly drill a proposal like this.

Q You're talking about the 80-acre option.

A The 80-acre option. Now, let's -- I call your attention to the third column which references economics of having to drill two wells on the same 80-acre prora-

tion unit, hence 40-acre spacing.

Where you have gross reserves averaging the same for the two wells, we're talking about just accelerating the recovery from that 80-acre spacing. The average life for the 80-acre wells, is about eight years, by the way, and for a 40-acre well sharing an 80-acre proration unit with another 40-acre well, it's about five years, the economic life.

As you can see here, the working interest investment is exactly double and the payout becomes 4.28 years. The after tax rate of return becomes 13.33 percent. The present value to investment ratio at 15 percent is slightly negative and the present value at 15 percent is -7.2 thousand dollars,(-$7,200).

Basically we, in our company, certainly would not drill a proposal like this, which shows would be an economical proposal and even if you had almost a treasury bond rate of return hole rate (sic), this would notwithstand the risk of oil and gas opportunities.

We further call attention to this central column on this where it says a new well on 40-acre spacing, if a -- if an operator were to get a farmout or otherwise obtain 40 acres to drill a well in this area, and he had the fear of someone else concurrently drilling a well and sharing his reserves, you see the same effect. That operator

would be actually discouraged from drilling a 40-acre well, because his economic outcome would be so poor.

In very brief summary, the second column is to show that -- that 40-acre spacing, being the spacing out here, would actually, potentially discourage development.

Q In addition to discouraging development, if the Division stays with the 40-acre spacing, can that result in the drilling of an unnecessary well?

A Yes, it would.

Q Do you have anything else with regards to your presentation, Mr. Carlson?

A No, sir.

MR. KELLAHIN: That concludes our direct examination of Mr. Carlson.

We would move introduction of his exhibits One through Four and then the propose order, Exhibit Number Eight, at this time.

MR. CATANACH: So Exhibits One through Four?

MR. KELLAHIN: And Eight.

MR. CATANACH: Exhibits One through Four and Exhibit Eight will be admitted as evidence.

Mr. Nutter, do you have any questions of the witness?

MR. NUTTER: No. I might have one question regarding the -- this might be directed to Mr. Kellahin, just for clarification. I don't know.

Mr. Kellahin, the 40-acre units that are in existence now would be automatically grandfathered in, is that correct?

MR. KELLAHIN: That was certainly our intention with the language, Mr. Nutter, and if we've not accomplished that, we'd be happy to redraft it.

MR. NUTTER: And then there's provision for obtaining a 40-acre nonstandard proration unit.

MR. KELLAHIN: For any subsequent wells.

MR. NUTTER: For any subsequent.

MR. KELLAHIN: Yes, sir.

MR. NUTTER: Now, would those 40-acre units also be entitled to the 275-barrel allowable?

MR. KELLAHIN: That was our intention.

MR. NUTTER: Okay. That's all I have.

CROSS EXAMINATION

BY MR. CATANACH:

Q Mr. Carlson, do you know why the Division originally consolidated these two pools?

A No, I don't. I believe it was possibly for a matter of convenience.

The Upper Bone Springs and Lower Bone Springs are not widely variant in lithologica or producing characteristics. This is a debris flow in depositional environment, and you just get widely variant characteristics, but they -- they vary uniformly, I guess.

This is actually depositionally, to oversimplify, maybe it's a junk yard of carbonate blocks that have fallen off of the Abo Reef to the north of this area in geologic time and so that's why you have such widely variant characteristics.

Q I just want to clarify one thing. The two wells located in Section 14, those are producing from the Third carbonate, is that correct?

A Those are producing from the Third Bone Spring carbonate, yes, sir.

Q What other wells that you know of are producing also from the Third Bone Spring carbonate?

A As highlighted on the map, the only

existing producer is the Mesa Compton Well in the northeast quarter of the northwest quarter of Section 35, approximately three miles south of there, and it is currently a 10-barrel, 15 Mcf a day well.

It will have an ultimate recovery around 40,000 barrels, which again establishes that this Third Bone Spring interval is the -- a salvage zone, if you will, in the south part of the field.

Q So then most of the wells in the south end of the field produce from the --

A Second.

Q -- Second Bone Spring.

A Yes, sir. That's not to say that the Second Bone Springs would not or could not produce somewhere in the north end of the field.

Q Has it been tested?

A It was added to the No. 15-1, which is just west of our wells in Section 14, although we did not see any production increase.

Q On Exhibit Number One you show the whole Bone Spring Field, is that correct?

A The yellow area is the current boundaries of the Airstrip-Bone Spring Field.

Q How many different operators do you have in this pool?

A As far as operators within the pool, I believe that Mesa, Chevron, Amoco, and Meridian Oil are the only operators of existing wells, although Bass Enterprises and a host of other companies have acreage whether now producing or not yet produced or has produced and has since been plugged in the field area.

And that was included in our notification exhibit.

MR. CATANACH: Will there be somebody to testify about that, Mr. Kellahin?

MR. KELLAHIN: We have provided as the alternative a certified, attested to certificate about notice, which is Exhibit Number Seven, in which we have attached the list of all interested parties that we can find, along with copies of the letters that were sent to those individuals.

A As far as current wells in the Airstrip-Bone Spring Field, I believe Amoco, Bass, Chevron, and Mesa and Southland Royalty, hence Meridian Oil are operators.

Q Have you had any indication about any support or opposition from any of these other operators?

A We got calls. Mobil is 50 percent interest owner in our acreage and Amoco, of course, is interested with respect to their -- their area down south. They, I guess, chose to not make an appearances, although when we

explained our proposal to them they -- they seemed to appear satisfied with what we were doing.

I guess the main point to be brought to bear here is the southern area of the field is probably on the order or 85 percent depleted and their level of interest is a little bit diminished at this time.

Q Where do you get that figure from?

A It's a very rough estimate based on just the current cumulatives and the apparent EUR's of the wells in the south area of the field.

Q Do you know if there's been any wells drilled to the south of the existing pool boundary?

A I do not have knowledge of any wells that have been drilled to that zone. This, as I said, this is a debris flow environment and normally produces within four to five miles of the Abo Reef complex boundary, which is noted on Exhibit One.

There have been numerous dry holes drilled which are indicated with the zero footage on the -- on the map that are scattered all over the map here as you can see.

MR. CATANACH: Mr. Kellahin, is your second witness going testify as to the drainage characteristics?

MR. KELLAHIN: Yes.

MR. CATANACH: I have no further questions of the witness.

ARDEN WALKER,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

A My name is Arden Walker. I'm a petroleum engineer, reservoir engineer, for Meridian Oil.

Q And your first name is A-R-D-E-N?

A That's correct.

Q Mr. Walker, have you previously testified before the Division?

A No, I have not.

Q Would you summarize for Mr. Catanach your educational experience and your professional employment?

A I received a Bachelor Science petroleum engineering degree from Texas Tech University in May of 1982.

I subsequently went to work for El Paso Exploration Company in Midland, where I served as a produc-

tion operations engineer over southeastern New Mexico, southwestern Texas, and southern Louisiana, also, for approximately three and a half years.

Subsequent to the merger of El Paso and Meridian, I've been for the past year a reservoir engineer with responsibilities over the southeastern corner of New Mexico as a reservoir engineer.

Q As a reservoir engineer, Mr. Walker, what studies or calculations have you made that are of importance to us in this hearing this morning?

A Well, I've performed a detailed study of the Airstrip-Bone Spring Field, trying to get a feel for the producing horizons, trying to quantify the expected recoveries from our wells in Sections 14 and 15, indicating drainage, use of volumetric analysis, and also some pressure studies.

Q You've had the opportunity to review and hear Mr. Carlson's proposal with regards to the special rules for this pool?

A That's correct.

Q Are you in support of the implementation of those rules?

A Yes, I am.

Q What specific matters do you have for the Examiner this morning with regards to your work?

A Well, first of all I don't know what exhibit you --

Q Well, why don't you describe for us the two areas that you specifically worked to and then we'll go to the exhibits themselves?

A Okay. I have done some pressure analysis work, which took initial reservoir pressures from the two wells in Sections 14 that showed significant decrease from the 14-1 Well to the 14-2 Well in a fairly short time period of approximately a year.

Q All right, sir, and what else have you done?

A I've also done some volumetric analysis work in which I've tried to use performance data, indicating ultimate recoveries of a range of 150,000 to 225,000 barrels and back out an areal recovery from those numbers.

Q Based upon that analysis have you reached any conclusion with regards to the implementation of 80-acre spacing for this pool?

A Yes. It appears that the wells in the north side, Sections 14 and 15, appear to be draining in excess of 80 acres, assuming, as I said, the performance data that I -- that I have looked at.

Q Would the flexibility of special pool rules that give the option to the operator to drill on 80-

acre spacing or the election to stay with 40-acre spacing one that would be in the best interests of protecting the correlative rights of Meridian and the other operators in the pool?

A I believe so, based primarily on the previous testimony of the widely varying characteristics of the Third Bone Springs and Second Bone Springs formations. I believe that the 80-acre spacing in our area is warranted, whereas in the south, if it was necessary to develop on 40 acres, it would be -- that flexibility would be warranted also.

Q Let's turn now to the volumetric calculations, which I believe are Exhibit Number Five, and have you summarize for us the information you have put on that exhibit.

A Okay. In Exhibit Number Five the volumetric analysis work that I've done on the two Meridian wells located in Sections 14, the 14 No. 1 well was completed in April of 1985 and it's located in the northwest quarter of the southeast quarter of Section 14. I have determined that ultimate recovery of 225,000 barrels based on the performance of the existing -- existing well, and using log data of 43 feet of net porosity, 4 percent average -- I mean 4.0 percent average porosity, formation volume factor of 1.06, which was taken from initial reservoir conditions,

water saturation of 32 percent, and a recovery factor of 25 percent, I have backed out from the recoverable oil equation an areal extent of 105.1 acres, which is indicated by this -- by this ultimate recovery.

The 14 No. 2 Well, which was completed in March of '86, indicates currently that it's going to recover in the range of 150,000 barrels from a net porosity thickness of 28 feet, 4 percent porosity average, using the same formation volume factor, water saturation of 30 percent, and again a recovery factor of 25 percent, and come up with an areal extent of 104.6 acres, which indicates very close agreement with the 14.1 well.

Q Did you provide this information to Mr. Carlson so he can make his economic analysis?

A Yes, I did.

Q Let's go now to Exhibit Number Six, which is your interference or pressure information, and have you describe for us what you've studied with regards to the pressure involved.

A Well, we have very limited pressure data in the area. The Meridian Tonto No. 14 State No. 1 Well, as I said before, completed in April of '85, had initial reservoir pressure of 3807 pounds. That was from a drill stem test of the zone at the time the well was drilled.

Less than one year later, March of 1986,

the Meridian Tonto 14 State No. 2 Well was drilled, effectively on a 40-acre spacing from the 14.1 Well, and had a reservoir pressure of 1650 psi, which is indicative of pressure drainage from the 14 No. 1.

Q Were Exhibits Five and Six prepared by you?

A Yes, they were.

MR. KELLAHIN: If I have not previously done so, Mr. Catanach, we would tender Mr. Walker as an expert engineer and move the introduction of his Exhibits Five and Six at this time.

MR. CATANACH: Mr. Walker is considered qualified and Exhibits Five and Six will be admitted into evidence.

MR. KELLAHIN: We would also at this time move the introduction of Exhibit Seven, which is the certificate with regards to the notification required by the Division pursuant to rules.

MR. CATANACH: Exhibit Number Seven will be admitted into evidence.

MR. KELLAHIN: That concludes our presentation and we tender Mr. Walker for cross examination.

MR. CATANACH: Mr. Nutter, do you have any questions of Mr. Walker?

MR. NUTTER: No, sir.

CROSS EXAMINATION

BY MR. CATANACH:

Q Mr. Walker, in your Exhibit Number Five, where did you come up with the estimated ultimate recovery?

A As I mentioned, they are based on estimated performance from the wells and using decline curve analysis we've arrived at the ultimate recoveries of 225,000 and 150,000 barrels.

Q Mr. Walker, have you studied the drainage characteristics of any of the wells in the south end?

A No, I have not.

Q Besides the initial reservoir pressure differences, have you noticed any other interference in the two wells?

A Not specifically from the producing characteristics of it.

MR. CATANACH: I don't have any further questions of the witness. He may be excused.

Mr. Kellahin.

MR. KELLAHIN: Yes, sir.

MR. CATANACH: We seem to have a problem with the advertisement in that no provision for an infill well finding was advertised.

MR. KELLAHIN: Yes, sir.

MR. CATANACH: We may -- may have to talk this over with the Director and see if we have to readvertise.

MR. KELLAHIN: I disagree with you about any defect in the notice, Mr. Examiner. I think the deletion of that information from the notice leaves the application as advertised on the docket more severe or restrictive than the applicant had intended.

By the deletion of that information, then, it's notice to the world that they should come and fight an 80-acre case that would result in the change of all those 40-acre wells to 80 acres.

By the addition of that information it is more liberal; in fact, is not unlike you handle the unorthodox well locations where you advertise a more restricted location and then at the hearing find the applicant is moving to a less restricted location.

In addition, I think you'll find that there's actual notice from Mr. Carr on behalf of Meridian in which he has told each of those individuals that had interest in the area that they should come and appear today, and I think there's enough notice there, enough opportunity for people to be aware. It was obviously good enough to get Mr. Nutter here today and it should be satisfactory for all purposes, and we would suggest that you need

not advertise this case again.

MR. TAYLOR: I tend to think that if these things are ever involved with special pool rules and we look at the letters and say that the letters to the offset operators specifically state that the request includes authority to drill a second well, I would suppose that would suffice.

MR. CATANACH: Then we'll leave the advertisement as it is.

Mr. Kellahin, I just have a casual question.

MR. KELLAHIN: You may get a casual answer, Mr. Chairman.

MR. CATANACH: Would Meridian gain any advantage in converting the whole pool to 80-acre spacing as opposed to trying to come in and create a separate pool?

MR. KELLAHIN: I do not believe we gain any advantage.

MR. WALKER: I believe we haven't established that there isn't some part of this overall interval that wouldn't be best spaced on 40 acres should it be produced in our end of the field.

We haven't exactly fully developed our end although the wells we have drilled we found

that eighties may be most appropriate, and so we just want the flexibility. Again, restating that the main thing we're after is the flexibility to do something in this widely variant environment.

MR. KELLAHIN: As you can see, it's a very difficult and complex geologic area and so long as the Division chooses to make the Bone Spring interval a single source of supply and one reservoir, then within the various qualities of reservoir in that interval we need the flexibility to handle the various members.

If the Division wants to change the approach and try to treat each one of these individual pods as a separate reservoir, then we certainly could come back in for special rules for a special portion of it, but that may simply lead us into another series of cases establishing separate pools for lots of little areas like this.

Our proposal today is the best as we can see to solve a complicated problem and to give all the operators an opportunity to be flexible under the rules.

MR. CATANACH: As I understand it, you're asking for temporary special rules?

MR. KELLAHIN: Yes, sir, we're suggesting a period of 18 months to give us an opportunity to see if this works. If there is an adverse consequence that we're not aware of, it would give us a period of time

in which to come back and solve that problem.

MR. CATANACH: Okay. Is there anything further in Case 9037?

If not, it will be taken under advisement.

(Hearing concluded.)

C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division (Commission) was reported by me; that the said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability.

Sally W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 9037, heard by me on Nov 19 1986.

David R. Catanach, Examiner
Oil Conservation Division

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO

20 July 1988

EXAMINER HEARING

IN THE MATTER OF:

In the matter of Case 9037 being reopened pursuant to the provisions of Division Order No. R-8364, which promulgated temporary special rules and regulations for the North Air Strip-Bone Spring Pool, Lea County, New Mexico.	CASE 9037

BEFORE: Michael E. Stogner, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Division: Robert G. Stovall
Attorney at Law
Legal Counsel to the Division
State Land Office Bldg.
Santa Fe, New Mexico

For the Applicant: W. Thomas Kellahin
Attorney at Law
KELLAHIN, KELLAHIN & AUBREY
P. O. Box 2265
Santa Fe, New Mexico 87504

I N D E X

TOM OLLE

E X H I B I T S

MR. STOGNER: Gentlemen, let's get started.

I'll call next Case Number 8037, which is in the matter of Case Number 9037 being re-opened pursuant to the provisions of Division Order No. R-8364, which promulgated temporary special rules and regulations for the North Air Strip-Bone Spring Pool in portions of Sections 14 and 15 in Township 18 South, Range 34 East, of Lea County, New Mexico.

I'll call for appearances.

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin, Kellahin & Aubrey, appearing on behalf of Meridian Oil, Inc.. Meridian Oil was the original applicant that sought the pool rules back in November of '86.

I have one witness, engineering witness, Mr Tom Olle.

MR. STOGNER: Are there any other appearances in this matter? Will the witness please stand and be sworn?

(Witness sworn.)

TOM OLLE,

being called as a witness and being duly sworn upon is oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Olle, for the record would you please state your name and occupation?

A My name is Tom Olle. I'm the Regional Reservoir Engineer for Meridian Oil in Midland, Texas.

Q Mr. Olle, you spell your last name O-L-L-I-E?

A O-L-L-E.

Q I'm sorry, O-L-L-E.

Mr. Olle, is Meridian Oil, Inc., still an operator in the Airstrip-Bone Spring Pool in Lea County, New Mexico, that's the subject of this application?

A Yes, we are.

Q And did your company originally seek the promulgation of special rules for this pool back in November of 1986?

A Yes, we did.

Q You sought at that time temporary 80-acre spacing for this pool and all the other pool rules?

A Yes.

Q And what is your position today after having studied the pool for 18 months or so?

A Based on field performance, based on bottom hole pressures that we've taken and will be presenting shortly, we feel that 80-acre spacing is justified and it will cause waste to go back to 40-acre spacing.

Q Let me direct your attention, sir, to what is marked as Exhibit Number One. Would you take a moment and orient the Examiner as to where the Air Strip-Bone Spring Pool lies in relationship to any other Bone Spring pool?

A Okay. It lies to the north of the Air Strip Pool, which is shown on the map down to the south and southeast. The acreage that's shaded in yellow is the acreage that Meridian has current operations in or is currenty under control through farm-in.

We currently operate five wells within the pool, four of which are producing from the most prolific Third Bone Spring dolomite, and these are the wells we'll be discussing today.

Q In the Air Strip-Bone Spring Pool, to the south and east of the subject pool, that production in that area is generally depleted or in advanced stages of depletion, is it not?

A That's correct.

Q And that pool down there deals with the Second Bone Spring.

A Yes, sir, Second Bone Spring dolomite.

Q When we look at the subject pool, the Air Strip-Bone Spring that you've been drilling in, identify for us within the yellow area and also within the dark black shaded outline, show Mr. Stogner what were the original wells at the time of the original hearing for spacing.

A Okay. At the time of the original spacing wells that existed were the Tonto 14-1, which is located in the northwest of the southwest of Section 14; the Tonto 14-2, which is located in the northeast of the southwest of Section 14; and the Tonto 15-1, which is located in in the northeast of the southeast of Section 15.

Q Were there any other Bone Spring wells in the pool at the time it was created?

A No, sir.

Q Identify for us what has been the subsequent development or attempts to obtain additional Bone Spring production, first of all directing your attention to what may have occurred between the Air Strip-Bone Spring and then the pool to the south and east of this pool.

A Okay. Subsequent to the original hearing, Meridian has drilled two wells within the acreage which is colored yellow in Section 14 and 15. Those are

the Tonto 15 No. 2, located in the southeast and northeast of Section 15 and the Tonto 14-3 which is located in the southwest and northwest of Section 14.

We have also drilled one well in the northeast of the -- excuse me, the northwest of the northeast of Section 23, just to the south here, and it did not encounter the Third Bone Spring dolomite.

Phillips has completed, or attempted a completion in the southwest -- northeast of the southwest of Section 15, which completed, which produced for a very short period of time out of the Third Bone Spring dolomite and is subsequently being tested in the Second Bone Spring Sand.

Q Does the attempts made since the original spacing hearing for establishing additional Bone Spring production between the Air Strip North and the Air Strip Pool down to the southeast, does that continue to satisfy you as an engineer that those two pools are in fact separated?

A Yes, sir, it does.

Q Let's look within the North Air Strip-Bone Spring Pool itself and have you identify for Mr. Stogner what has been the further development of the pool since the original hearing?

A Okay. Within the pool there

have been two wells drilled that are currently completed. They are, as mentioned earlier, the Tonto 15-2, which is located in the southeast of the northeast of Section 15, and the Tonto 14-3, which is located in the southwest of the northwest of Section 14.

Q Let me direct your attention now, sir, to Exhibits Two through Six and have you identify that series of exhibits for us.

A Okay. Exhibits Two through Six are the production curves for the wells producing from the Tonto -- the North Air Strip Field.

Q Can you generally characterize for us what information you see in analyzing the production curves for the pool wells?

A What you see is that the solid -- on these curves the solid lines are gross oil per month and the little triangles are the water production.

And what we've seen on these is that initially these were very high rate wells and produced at top allowable rates. Currently if the pressure in the reservoir is declining the production rates are beginning to drop off.

Q What does that tell you about the spacing pattern for further development of the pool wells?

A It -- from our analysis of these decline

curves we evaluated what we felt the ultimate recovery on these wells would be.

The current cumulative on these wells is approximately 70-to-270,000 barrels per well. The ultimate recoveries estimated in these wells are about 170-to-385 MBO per well, and from this and when we get to a later exhibit -- am I getting ahead here a little bit?

Q Well, let's turn past the production plots and look at Exhibit Seven through Eleven and have you generally describe what that information is.

A Exhibits Seven through Eleven are the tabular data that back up the production curves of Exhibits Two through Six.

Q All right, let's go to the volumetric calculations now where -- which are shown on Exhibit Number Twelve and have you describe for us how you as an engineer have analyzed the ability of these wells to drain more than 40 acres.

A What we have done is using the decline curves in analogy to other fields that are -- had produced from similar dolomites, have evaluated what we feel the ultimate recovery from these wells will be combining their production to date with the decline trend.

And what we've found is that the ultimate recovery from these wells will be approximately 170 to

385 MBO per well.

The well -- we have done a volumetric calculation then from these calculations of ultimate recovery and using the net pays from the log calculations and a recovery factor of 25 percent, we've estimated that the drainage areas for these wells will range from just over 80 acres to almost 160 acres, indicating that 80-acre spacing is warranted.

Also, in looking at these wells we've found that the lower ultimate recoveries are being indicated by the later drilled wells, especially the Tonto 14-3 and the Tonto 15-2, which indicates that portions of their reserves have already been drained by the existing wellbores, which again corroborates the large drainage area.

Q How do your volumetric analyses compare to the volumetric analyses presented at the original spacing hearing insofar as we compare the Tonto 14-1 and the 14-2 Wells to what you've done?

A Essentially in comparing these the log calculations are essentially the same with the exception of we're estimating slightly higher porosity due to re-evaluations, fractured dolomite; we're estimating slightly higher porosity and on the Tonto 14-2 it also indicated slightly higher net pay.

Q In addition to making a volumetric ana-

lysis of the reservoir performance, Mr. Olle, have you also analyzed pressure data for the pool?

A Yes, sir, we have. Exhibit Twelve, excuse me, Exhibit Thirteen is a listing of the bottom hole pressures that we've taken in the North Air Strip Field. Essentially on all of our wells we've taken initial bottom hole pressures at the time they were drilled and completed, and we found that in the Third Bone Spring dolomite out here the initial bottom hole pressure is approximately 3800 pounds. Let me also mention the nomenclature on this is that what says it's lower is a dolomite string within the Third Bone Spring dolomite, which was productive from the Tonto 15-1 Well and when it says middle and upper are the dolomites, the third Spring dolomite, which is the primary producing zone in the field.

Essentially what we've found is that the initial bottom hole pressure in the field was about 3800 pounds in April of '85 when the Tonto 14-1 was completed. By March of '86, when the Tonto 14-2 was completed, that bottom hole pressure had dropped to 1650 pounds.

Q You had those two pressure points or pressure information at the time of the original spacing hearing.

A Yes, sir, that's correct.

Q And the balance of the pressure informa-

tion is information that's been developed subsequent to that hearing.

A Yes, sir. The subsequent information, the Tonto 14-3 in the correlative zones had a pressure of about 1480 pounds in January of '87 when it was completed and in June of 1987 when the Tonto 15-2 was completed the pressure in the reservoir had dropped to approximately 1150 pounds.

So all of the wells have shown continuing decline in bottom hole pressure in subsequent development. Also, for comparison, we went back in March and April of this past year and ran additional bottom hole pressures on the wells and we found that the indicated pressure in the 15-2 was in the range of about 700 and -- well, for instance, in March was 798 pounds. The bottom hole pressure in the 14-1 was 809 pounds, indicating two things that the bottom hole pressure does. It means we're still getting very high rates out of these wells, indicating very high permeability in a fractured formation. We're seeing that from what is called the middle and upper, and we'll be able to show these on a cross section we'll present in a moment, that there's very good vertical communication within the Third Bone Spring dolomite with less lateral communication and we feel that 80-acre spacing is warranted.

Q Let's take a moment and show Mr. Stogner

the relationship on the cross section of the different Bone Spring members.

Identify for the record, Mr. Olle, what is Exhibit Number Fourteen?

A This is an east/west cross section across the field from the Phillips well in Section 15 over to the Mesa Petroleum well in Section 13, and essentially what it shows is that this zone of Third Bone Spring dolomite, which is the common pay, is most persistent across the center of the field and on Meridian's lease.

The -- for nomenclature purposes, we mentioned the lower zone, what's lower is this Tonto zone, or the Third Bone Spring sand, and when I was mentioning the 15-2 having the same pressures in the Middle and Upper were these two sets of perforations shown here from about 90 -- one set has a top at about 93 -- 9530 and the other set at about 9670. They both had the same bottom hole pressures.

And essentially what the bottom hole pressure data has indicated to us is that this entire formation is pressure communicated and both laterally and vertically persistent across the field.

Q In your opinion, Mr. Olle, will the continuation on a permanent basis of 80-acre spacing for this pool be one -- be a procedure and rules that will avoid the

drilling of unnecessary wells?

A Yes.

MR. KELLAHIN: That concludes our examination of Mr. Olle, Mr. Stogner, and we move the introduction of Exhibits One through Fourteen.

MR. STOGNER: Exhibits One through Fourteen will be admitted into evidence at this time.

CROSS EXAMINATION

BY MR. STOGNER:

Q Mr. Olle, are all these wells that are presently producing out there, are they all producing from a single wellbore as far as are any of them dually completed?

A No, there isn't.

Q (Unclear) weeks ago, whenever it first came out there was an upper and a lower and then it went back and forth.

A No, in this field there have always been the Third Bone -- it's -- all the production of this field is essentially from the Third Bone Spring dolomite and it's always been produced together.

Q Okay.

A I think that the original Air Strip

Field to the south, originally was set up with separate pool rules for an upper and lower zone and then they were merged at a time previous to the previous hearing.

MR. STOGNER: I have nothing further of this witness.

Is there any other questions of Mr. Olle?

MR. KELLAHIN: No, sir.

MR. STOGNER: He may be excused.

Does anybody else have anything further in the Case Number 9037 reopened today?

It will be taken under advisement.

(Hearing concluded.)

C E R T I F I C A T E

I, SALLY W. BOYD, C. S. R. DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division (Commission) was reported by me; that the said transcript is a full, true and correct record of the hearing, prepared by me to the best of my ability.

Sally W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 9037, heard by me on 30 July 1958.

, Examiner
Oil Conservation Division