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 MERIDIAN OIL, INC., FOR AN UNORTHODOX COAL GAS WELL LOCATION, RIO ARRIBA COUNTY, NEW MEXICO

CASE NO. 11,565

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: MICHAEL E. STOGNER, Hearing Examiner

July 11th, 1996

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, MICHAEL E. STOGNER, Hearing Examiner, on Thursday, July 11th, 1996, 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.

* * *

I N D E X

July 11th, 1996
Examiner Hearing
CASE NO. 11,565

	PAGE
EXHIBITS	3
APPEARANCES	3
APPLICANT'S WITNESSES:	
ALAN ALEXANDER (Landman)	
Direct Examination by Mr. Kellahin	4
Examination by Examiner Stogner	8
GREGORY L. JENNINGS (Geologist)	
Direct Examination by Mr. Kellahin	10
Examination by Examiner Stogner	16
MARK P. CASTIGLIONE (Engineer)	
Direct Examination by Mr. Kellahin	18
Examination by Examiner Stogner	21
REPORTER'S CERTIFICATE	27

* * *

E X H I B I T S

Applicant's	Identified	Admitted
Exhibit 1	5	8
Exhibit 2	6	8
Exhibit 3	12	16
Exhibit 4	12	16
Exhibit 5	13	16
Exhibit 6	14	16
Exhibit 7	19	21
Exhibit 8	20	21
Exhibit 9	20	21

* * *

A P P E A R A N C E S

FOR THE APPLICANT:

KELLAHIN & KELLAHIN
117 N. Guadalupe
P.O. Box 2265
Santa Fe, New Mexico 87504-2265
By: W. THOMAS KELLAHIN

* * *

WHEREUPON, the following proceedings were had at 9:09 a.m.:

EXAMINER STOGNER: At this time I'll call Case Number 11,565, which is the Application of Meridian Oil, Inc., for an unorthodox coal gas well location in Rio Arriba County.

At this time I'll call for appearances.

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin and Kellahin, appearing on behalf of the Applicant, and I have three witnesses to be sworn.

EXAMINER STOGNER: Are there any other appearances?

Will the three witnesses please stand to be sworn at this time?

(Thereupon, the witnesses were sworn.)

EXAMINER STOGNER: Mr. Kellahin?

MR. KELLAHIN: We call Mr. Alan Alexander as our first witness.

ALAN ALEXANDER,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Alexander, would you please state your name

and occupation?

A. My name is Alan Alexander. I'm currently employed with Meridian Oil, Inc., as a senior land advisor in our Farmington, New Mexico, office.

Q. As part of your responsibilities, Mr. Alexander, have you made a study of the ownership surrounding and including the spacing unit that's the subject of this Application?

A. Yes, sir, I have.

MR. KELLAHIN: We tender Mr. Alexander as an expert petroleum landman.

EXAMINER STOGNER: Mr. Alexander is so qualified.

Q. (By Mr. Kellahin) Mr. Alexander, if you'll turn to the Meridian exhibit book that you're presented and identify for us Exhibit 1.

A. Exhibit 1 is the Application that we've presented to the Division that asks for permission to drill a replacement Fruitland Coal well, the San Juan 29 and 7 Unit Number 505R well, to be drilled at an unorthodox well location 1850 feet from the south line and 940 feet from the east line of Section 5 of 29 North, 7 West, in Rio Arriba County, New Mexico.

Q. Mr. Alexander, you're knowledgeable and familiar about the Division rules for the Basin Fruitland Coal Gas Pool with regard to locating wells?

A. Yes, sir, I am.

Q. And this well would be at a standard footage, but it is in the wrong quarter section, is it not?

A. That's correct.

Q. Let's turn to Exhibit 2 and look at that acreage dedication plat. The original well in the east half of Section 5 is located up in the northeast quarter?

A. Yes, sir, it is.

Q. And that would be the San Juan Unit 29-7 well 505?

A. Yes, sir, that actually is more clearly seen on the nine-section land plat following the offset operator plat.

Q. Okay. The first attachment behind Exhibit Tab Number 2, then, is your notification list, and other than Meridian, the only other party to notify is Merrion Oil and Gas Corporation?

A. Yes, sir, that's correct.

Q. Have you received any objection from Merrion with regards to the approval of the Application?

A. No, sir, we have not.

Q. Let's turn to the second plat behind Exhibit Tab Number 2 and have you identify for us the information shown on that display.

A. That's a nine-section plat that shows Section 5

in the center of the nine sections. We have symbols down at the bottom of the page that show the individual wells that are represented on the map. More particularly, the Fruitland Coal wells are represented by the triangle with the gas symbol in them, with the triangle pointed to the top. And for reference purposes, the Number 505R well, the new proposed well, is shown in a heavy triangle. In relation to that, you will see the Number 505 existing Fruitland Coal well up in the northeast quarter of Section 5.

Q. The acreage dedication for the well would be the east half of Section 5?

A. Yes, sir, that's correct.

Q. Let's look at the particular location. While it's not apparent on this display, describe verbally the fact that you have made some accommodation to a surface owner with regards to the actual placing of the well 505R.

A. Not shown on this land plat is a brand-new Mesaverde well. It's the 90A Mesaverde infill well, which is -- infill the existing 90 well. This lease is a federal lease, however it is private surface. And to accommodate the private surface owner, we have agreed to drill the Number 505R Fruitland Coal well on the same pad as the Number 90A well. And that's primarily the reason that we are locating the well where we are locating it.

MR. KELLAHIN: All right, sir. That completes my examination of Mr. Alexander.

We would move the introduction of Exhibits 1 and 2.

EXAMINER STOGNER: Exhibits 1 and 2 will be admitted into evidence.

EXAMINATION

BY EXAMINER STOGNER:

Q. Let's see, Mr. Alexander, in looking at that nine-section plat on Exhibit Number 2, you don't show on there the Number 90A well?

A. No, sir, we just completed it, so it hasn't been added to our maps yet.

Q. And that 90A well is what kind of completion?

A. It's a Mesaverde completion; it's an infill to the existing Number 90 well up in the northeast quarter.

Q. And what will become of the Well Number 505?

A. We would anticipate plugging and abandoning that well.

Q. It hasn't been -- Is it still producing?

A. Yes, sir, it is currently still producing.

Q. And that will continue up to -- Is it Meridian's plan to continue producing the 505 up until the time the 505R is completed and ready to be put on line?

A. Yes, sir, the Number 505 is a very marginal well.

It doesn't produce -- It only produces around 50 MCF a day. But that would be our plan.

Q. Now, when you said that the present status of that east half of Section 5, that's a federal mineral lease?

A. Yes, sir, it is.

Q. And it's private surface?

A. Yes, sir, it is.

Q. Does the whole east half of that section belong to one owner, or --

A. The surface owner?

Q. Yes, sir.

A. I believe that it does. I'm not exactly certain, I just knew the location was on him. But I believe the rest of the east half belongs to Mr. Candelaria also.

Q. Are there any wells that you know of in the nine -- I'm sorry, in the east half of Section 5, other than the 90, the 505, and the two proposed, 505R and the 90A, or I should say the 90A that has been drilled?

A. No, sir, that should be all of the wells.

Q. That is all of the wells?

A. Yes, sir.

Q. Where actually is this site located?

A. It's within our 29 and 7 unit, which would be --

Q. I was more on topographic. Where from a major

town, or is it along the river?

A. No, sir. Let's see, I believe that we had it spotted -- well --

Q. I'm just trying to make a reference here.

A. I thought we actually had a call for you here, but --

A. I do on the advertisement, one mile south of Navajo City in New Mexico.

A. Okay.

Q. But I'm not familiar if that was down in the river bottom.

A. No, sir, it's not in the river bottom.

EXAMINER STOGNER: I have no other questions of Mr. Alexander at this time, Mr. Kellahin.

MR. KELLAHIN: All right, sir.

EXAMINER STOGNER: You may be excused.

MR. KELLAHIN: Mr. Greg Jennings is our next witness, Mr. Examiner.

GREGORY L. JENNINGS,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

A. Yes, my name is Gregory Jennings, and I'm a senior geologist with Meridian Oil, located in Farmington, New Mexico.

Q. On prior occasions have you testified before the Division concerning geologic matters in the San Juan Basin?

A. Yes, I have.

Q. And have you testified about the off-pattern coal wells on prior hearings?

A. Yes, I have.

Q. Is this particular well one of the wells within your team's project area with regards to coal gas development?

A. That's correct.

Q. And based upon your responsibilities, have you made a geologic study of where in your opinion is the preferable place to locate a replacement well in the east half of 5 for the original Well 505?

A. Yes, I have.

MR. KELLAHIN: We tender Mr. Jennings as an expert geologist.

EXAMINER STOGNER: Mr. Jennings is so qualified.

Q. (By Mr. Kellahin) Mr. Jennings, let me have you turn to the exhibit book. In looking at the display behind Exhibit Tab Number 3, let's take a moment and look at the structure as you've interpreted for this area.

A. Okay, Exhibit 3 is a structure map on a marker in the Lewis formation, which is a few hundred feet below the Fruitland Coal. And the basic purpose of this exhibit is to show the relatively gentle structural nature of the area, gentle dip to the northeast. There's nothing structurally going on that causes any separation of the reservoir, no faulting, et cetera.

Q. So in looking for a replacement well for the location for the 505, then, structure is not a component for you making a geologic decision?

A. That's correct. In fact, as we go through these exhibits, we'll be showing you a couple of traditional geologic elements which do not have an immediate bearing on the proposed location.

Q. All right. Let's turn to Exhibit 4, then, and let's look at the coal distribution in terms of an isopach and have you describe for us what it shows you when we look at the nine-section area -- Well, it's a twelve-section area.

A. Yes, this is an isopach of the coal, and all of the maps that we're going to look at show the original Number 505 in the northern part of the section, the proposed 505R in the southeastern quarter of the section.

You can see the actual location of the 90A, which we referenced earlier. It's on the same pad that we plan

to drill the 505R.

And it also -- This map and the other maps also show a cross-section trace which we will look at momentarily, A-A', which is a cross-section through the coal.

This map, being an isopach of the coal, shows in the area where we're proposing to drill a thickness ranging from 55 to 65 feet thick, coal. And as you've probably heard testimony in the past, the thickness of the coal is not a primary factor controlling the production of the coal.

Q. Is that true in this example, then, as well?

A. Yes.

Q. Okay, let's turn to Exhibit Number 5. Turn to the first display behind that exhibit tab, and let's look at your coal daily rate production map. Describe for us how you have constructed it and what it shows you.

A. This map is a map showing the daily production from the coal wells in the area in MCF per day. The area inside the green is greater than 500 MCF per day, and as you get into the pink, you get into 1000 MCF per day, or one million cubic feet per day.

And this map really tells the tale as far as why we want to drill in the southeast quarter. The geology of the coal and the reservoir characteristics of the coal are

fairly uniform as far as structure, as far as thickness. The key is permeability. And this linear northeast-southwest trend that the production map shows is an area of enhanced permeability, we believe, due to natural fracturing.

Q. Describe for us the significance, then, of the contouring of the daily rate of production and how it might relate to the fracture trend in the coal.

A. Well, it's a -- There's a strong northeast-southwest trend that runs from the northeast corner of the map down through the Number 519 well, which is south of our proposed location. And this very well identifies the natural trend that we're hoping to get into.

And as you can see, the Number 505, the original well, was drilled in an area that is not in the natural fracture trend, and thus has very low production rates.

So our goal is to try to get into the area of enhanced permeability by drilling in the southeast quarter.

Q. Okay. Let's turn now to the three-well cross-section. It's in the pocket behind Exhibit Tab Number 6. If you'll take a moment to unfold that, we'll have you describe that display.

Start with the well in the north, which is the 505. You've gone through the 505R, and what you're utilizing here is the log of -- What was that? A Dakota

well?

A. That's right.

Q. That was the infill Mesaverde well, wasn't it?

A. Correct, that's the 90A that we just finished drilling, and we're in the process of getting ready to complete it.

Q. All right. Describe for us what we're seeing.

A. Well, the coal packages -- These are mud logs, as we typically don't run wireline logs in our open-hole coal completions. And they provide additional data regarding sample descriptions, et cetera.

The coal zones are marked in black, and what you see, that the main coal zones are fairly continuous. There are three main packages, three main coal zones, and they -- The thickness doesn't vary much at all, across the area of interest, and if you were to read the fine print and the coal sample descriptions, what you'd find is that the samples don't vary a lot either.

Really, the natural fracturing in the area is the key, and of course that's very difficult to see from any conventional logging or samples. It's more a matter of deduction. Essentially what this cross-section shows is that the coals are continuous across the area where we propose to drill.

Q. So then you have to go back to something like

Exhibit 5 and infer from the rate of production, plus whatever information you have in this area, that there is a fracture orientation and that by moving closer to that orientation you hope to get into an area of better permeability in the coal?

A. That's correct.

MR. KELLAHIN: Mr. Examiner that concludes my examination of Mr. Jennings.

We move the introduction of his Exhibits 3 through 6.

EXAMINER STOGNER: Exhibits 3 through 6 will be admitted into evidence at this time.

EXAMINATION

BY EXAMINER STOGNER:

Q. In looking at the Exhibit Number 5 -- that's the map that's showing the production rates -- that appears or that -- as I understand it, the higher production rates that you see back to the northwest of Section 5 is due to what? Increased fracturing or -- What's increasing the permeability?

A. The pink area, especially, but the whole trend, is due to a natural fracture trend that exists in that area.

And we can feel comfortable about this interpretation because we, of course, have studied the

whole Basin, and we've run a lot of natural fracture identification logs, and we've found the open fracture orientation to be northeasterly in this area, as well as in most of the central part of the Basin. And you commonly see these very linear northeast trends that are related to natural fracturing. You see some other evidence, as you drill wells or as you log wells, to support that, or in cores.

So it fits with a regional picture. We feel very comfortable that that's the primary controlling factor on permeability.

Q. Has there been any indications that there is a -- why these fracture trends occur in different places? Is it due to structure underneath, or what causes it?

A. Yes, ultimately the natural fractures are controlled by basement tectonics, we believe, although the San Juan Basin is very gentle structurally. You don't find any structural relief.

If you look at a present-day structure map, as we looked at with our first exhibit, geologic exhibit, you don't see any folding that would tell you where the natural fracture trends are.

What we think control them were a series of northeast and northwest basement faults way back in the beginning of the deposition of these rocks that have

actually undergone strike-slip movement, more horizontal movement, as opposed to vertical movement.

So you can find these naturally fractured areas when you look at a production map, more so than you can when you look at a structure map.

So it's -- They're elusive and difficult to find. One of the beauties of this Basin is that we have so much production from so many wells that it helps us identify some of these areas.

Q. That's interesting, then. You just find them when you find them?

A. That's not a bad way to summarize it. We have tried very hard over the years to develop techniques to define the fracture trends, and it's difficult.

EXAMINER STOGNER: I don't think I've ever had that question answered before until now.

No other questions at this time.

MR. KELLAHIN: All right, sir.

EXAMINER STOGNER: Thank you, sir.

MARK P. CASTIGLIONE,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. All right, sir. Are you all set?

Would you please state your name and occupation?

A. My name is Mark Castiglione, and I am a Reservoir Engineer 2 with Meridian Oil.

Q. Mr. Castiglione, have you ever testified on prior occasions before the Division Examiner?

A. Yes, sir, I have.

Q. And as part of your duties as a reservoir engineer, have you made a study of how your company proposes to drill and complete this new well as a replacement well?

A. Yes, sir, I have.

MR. KELLAHIN: Steve, Mark spells his last name C-a-s-t-i-g-l-i-o-n-e.

Q. (By Mr. Kellahin) All right, let's turn, then, to your first displays. If you'll look at Exhibit Tab Number 7, let's look at the first display behind that exhibit tab. Does that represent your work product?

A. Yes, sir, this is a wellbore diagram of the current 29-7 Unit Number 505. You will note that this well was drilled through the Fruitland Coal, and 7-inch casing was set through the Fruitland Coal and cemented there, and then it was perf'd and frac'd using a cross-linked gel.

Q. If the Examiner wants to look at the details of that information, there is a data sheet that follows behind the schematic of the cased and frac'd well?

A. Yes, sir, that's correct.

Q. All right. Let's now turn and let's look at what the performance has been on the original 505 well, if you'll look at the display following Exhibit Tab Number 8.

A. This plot shows the current -- or shows the gas production history of this well. You'll note that the red curve represents the gas production, and note that production has never exceeded 100 MCF per day.

Note on there that we did test this well on compression in early 1996, the first three months of this year.

Q. What was the reason to do that?

A. The reason that we did that was to see if the well was producing -- would produce at higher rates when it was under optimum pressure conditions, and note that it did not produce any better.

Therefore, that leads us to believe that the fact that this well is not a good producer is due to reservoir permeability, other than the fact that the well is not optimized.

Q. All right. So you don't find anything wrong with the well in the way it was drilled or completed; it's just in a poor part of the reservoir?

A. That's correct.

Q. Let's turn now to Exhibit Number 9 and look at

the display following that exhibit tab and have you describe for the Examiner what Meridian proposes to do in terms of drilling and completing the replacement well.

A. This is a wellbore diagram of the replacement well. The 7-inch casing, we will top-set the Fruitland Coal and set 7-inch casing and set and cement it above the Fruitland Coal. Then we will drill out the Fruitland Coal and complete it using an open-hole cavitation technique. Then we will run a 5-1/2-inch liner that is pre-perf'd and will not cement it in the open hole.

MR. KELLAHIN: All right, sir.

That concludes my examination.

We move the introduction of Mr. Castiglione's Exhibits 7, 8 and 9.

EXAMINER STOGNER: Exhibits 7, 8 and 9 will be admitted into evidence at this time.

EXAMINATION

BY EXAMINER STOGNER:

Q. The proposed completion method that you have on Exhibit Number 8, for the Number 505R, is that typical of most Meridian coal gas completions at this time?

A. Yes, sir, where we find a better permeability, that is the preferred method of completion.

Q. And that's with that liner?

A. Yes, sir, that's with the pre-perforated liner

that's just run down in the open-hole section.

Q. Now, that liner that you -- that is being set, is that a -- did you say that was pre-perf'd, or is that a screen liner or --

A. It's pre-perforated.

Q. Any kind of special conventions, or just with holes in it?

A. Just with holes. Generally what we do is, we look at the mud log and tried to orient where we perf'd the liner, where we put the perf'd sections of liner, with the coal zones.

Q. And then the completion technique used after the liner is set, is there any frac'ing done?

A. No, we do -- what we do is cavitation technique, and that's done before the liner is set. It's just a series of either letting the well naturally build up and then we surge the well to atmosphere, or we actually pressure up on the formation itself and then let it release it to atmosphere. And what we find is that this creates an enhanced permeability zone around the wellbore.

This mainly works in the higher-perm places, portions of the Fruitland Coal reservoir.

Q. I'm going to throw this open-ended question out to anybody that can answer it, so Mr. Alexander or Mr. Jennings...

Is this presently a common completion technique, to drill a replacement well for one that is, for some reason, producing low capabilities? Are we going to see more of this in the future? And to what degree?

A. (By Mr. Castiglione) The original well -- Let me make the point that the original well, the fact that it was completed using a frac technique is not the reason that it's a poor producing well.

We do have a well -- If you'll note on Exhibit 5, the production contour, that directly north of the proposed 505R is the 30 and 6 429. It's a cased and frac'd well, and it makes about a million a day.

Directly south of the 505R is the 29-7 Number 519. It's a cased and frac'd well and makes about 900 MCF per day.

But to answer your question regarding future work, in areas where we feel like we do have enhanced or better permeability, then we would probably choose to go with the open-hole completion technique.

As to whether we would ever sidetrack maybe the 519 and cavitate, complete that, we might look at that in the future, but we haven't decided to do such yet.

EXAMINER STOGNER: Mr. Kellahin, do one of your other witnesses want to add any --

MR. KELLAHIN: Yes, sir, let me make sure I know

what the answer is.

(Off the record)

MR. KELLAHIN: Mr. Jennings has advised me they've done 12 of these replacements, and that's probably near the end of their schedule of replacement wells. But at this point, they've done about 12.

EXAMINER STOGNER: I was sitting here thinking since the coal gas pool rules have been active now for quite some time and there has been who knows how many wells drilled -- and I'm just speaking on the record at this point -- perhaps it might be time to revisit the coal gas rules.

And this northeast-southwest pattern, has that become obsolete? Do the operators now need to be able to have the four quarter sections to choose from more freely?

And in some of the old original wells out there, since we do not allow simultaneous production at this point of two wells on a proration unit, could that somehow be changed, allowing an old well that produces at a low rate to continue producing, instead of plugging and abandoning it while you're going ahead and bringing another replacement well on line?

Just food for thought, just something to -- that I can say that the Division is proactive in this situation. But it would have to be -- I think, come from the committee

themselves. Maybe revisit it. We haven't revisited those rules in some time now. Probably time to think about it.

MR. KELLAHIN: When Meridian and I and others helped develop those rules, one of the concepts in that rule is the ability under existing rules to identify specific areas for infill drilling increased density.

The predicate under those rules is a rather complicated computer analysis of performance, so that you can hypothecate drainage areas for coal gas wells, and the benchmark in terms of the database is a very large book of information.

But Mr. Alexander and Jennings and others, including I, have examined that for Meridian, and what we were looking to were area-specific modifications of the Basin rules.

And so we appreciate your interest. We are examining that issue. And if we are to come back, then it will be because Mr. Jennings and others have concluded that there's a described area within the Basin that is usefully developed with increased density.

EXAMINER STOGNER: In those areas -- and that rule is still a good one, and for areas such as that, that, I think, still belongs in there.

But how about these anomaly areas where that really doesn't hold true, nor would it be worth going into

a large investigation in these small areas, but allowing in the general rules a more freer aspect at this time? It might be something to look at, instead of...

Anyway, anything further in Case Number 11,565?

MR. KELLAHIN: Just to have you take notice of the certificate of mailing that is filed in conjunction with the exhibit book. We've provided notification to Merrion Oil and Gas Corporation pursuant to the rules.

EXAMINER STOGNER: Nothing further in Case Number 11,565, then this case will be taken under advisement.

And let's take a ten-minute recess at this time.

(Thereupon, these proceedings were concluded at 9:43 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11565, heard by me on 11 July 1996.

, 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 July 13th, 1996.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1998