STATE OF NEW MEXICO
ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

ORIGINAL

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

APPLICATION OF CONOCOPHILLIPS COMPANY OIL CO., and BURLINGTON RESOURCES OIL & GAS COMPANY (COLLECTIVELY "COPC") FOR PRE-APPROVAL OF DOWNHOLE COMMINGLING OF PRODUCTION ON A POOL-WIDE BASIS FOR THE BASIN-MANCOS GAS POOL, SAN JUAN, RIO ARRIBA AND SANDOVAL COUNTIES, NEW MEXICO

Case No. 14862

TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: RICHARD EZEANYIM, Technical Examiner
DAVID K. BROOKS, Legal Examiner

June 25, 2012

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, RICHARD EZEANYIM, Technical Examiner, and DAVID K. BROOKS, Legal Examiner, on Monday, June 25, 2012, at the New Mexico Energy, Minerals, and Natural Resources Department, 1220 South St. Francis Drive, Room 102, Santa Fe, New Mexico.

REPORTED BY: PAUL BACA, CCR #112
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A P P E A R A N C E S

For Applicant:

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Also Present:

David R. Catanach

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I N D E X

CHAIRMAN BROOKS: At this time we'll call Case Number 14862 Application of ConocoPhillips Company and Burlington Resources Oil & Gas Company for pre-approval of downhole commingling of production on a pool-wide basis for the Basin-Mancos gas pool.

Call for appearances.

MR. KELLAHIN: Mr. Chairman, I'm Tom Kellahin of the Santa Fe law firm of Kellahin and Kellahin, appearing this morning on behalf of the applicant. And I have three witnesses to be sworn.

CHAIRMAN BROOKS: Would the witnesses please stand and swear.

(Witnesses sworn.)

CHAIRMAN BROOKS: Please state your names for the record.

THE WITNESS: Charles Creekmore.

THE WITNESS: Dryonis Pertuso.

THE WITNESS: Zack Swaney.

CHAIRMAN BROOKS: You may proceed, Mr. Kellahin.

MR. KELLAHIN: Thank you, Mr. Examiner.

ConocoPhillips and Burlington Resources are here before you this morning to ask you to revisit a topic that was initiated when the division

adopted the Basin-Mancos gas pool.

That order was issued in the fall of '08. And in doing so, the division adopted rules for this pool but chose not to authorize this pool as a pre-approved downhole commingling pool.

We're here before you today to ask your approval to create a pre-approval for the Basin-Mancos gas pool. That pre-approval will involve four issues with regards to data that's normally filed with the division form C-1078.

The exceptions we're asking for are the pressure qualifications, the fluid compatibilities, the economic criterias, and the value of that production.

In doing so, it will help us streamline this pool and the wells involved in this pool. The end objective is that the Mancos collectively, as an entire group of subsections, then can be commingled with Mesaverde and Dakota production. And in doing so, we can increase production that would otherwise not be found.

In doing so, we have three witnesses: A land witness, to give you the background of how this is set up and used by the operators; we have a geologic witness to describe the geologic values

involved in the commingling; and an engineer, to describe the technical aspects of each of those four components.

With your permission, we'd call at this time Mr. Chuck Creekmore.

CHAIRMAN BROOKS: Mr. Creekmore.

You may proceed.

MR. KELLAHIN: Thank you, Mr. Examiner.

The prehearing statement that was filed in this case details with specificity all of the specifics with regards to the testimony this morning. So if you need a summary, you can find that in the prehearing statement.

CHARLES CREEKMORE,

after having been first duly sworn under oath, was questioned and testified as follows:

EXAMINATION

BY MR. KELLAHIN:

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

A. Charles Creekmore.

Q. And where do you reside, sir?

A. In Farmington, New Mexico.

Q. What is your occupation?

A. I'm a landman.

Q. And by whom are you employed?
A. By ConocoPhillips and Burlington Resources Oil & Gas Company.
Q. On prior occasions, Mr. Creekmore, have you testified as an experienced expert petroleum landman?
A. Yes.
Q. As part of your responsibilities to your company, do you do land work for both ConocoPhillips and Burlington Resources?
A. Yes, I do.
Q. Collectively, we'll -- I'll simply refer to them as ConocoPhillips, if that's all right.
A. Yes.
Q. As part of your land duties do you also have responsibilities for knowing the rules and regulations of the division?
A. Yes.
Q. In regard to this particular case, have you made yourself knowledgeable about the Basin-Mancos gas pool rules?
A. Yes, I have.
Q. As part of that effort have you assimilated and compiled data with reference to that pool?

A. Yes, I have.

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

CHAIRMAN BROOKS: So accepted.

Q. (By Mr. Kellahin) Mr. Creekmore, let's turn to the exhibit book and explain to the Examiner how you've organized the book, first of all.

When we look at the first 14 tabs, those are all documents that relate to land matters and to regulatory filings and orders of the division?

A. Yes. I have tried to capture the history of the Basin-Mancos from the original rule to where we are today.

Q. And when we get behind Tab 15, then, we are into the geologic and engineering presentation?

A. Yes.

Q. To start off then, Mr. Creekmore, would you turn to the exhibit book, what we will call Exhibit Tab Number 1.

A. (Witness complies.)

Q. And behind that tab what do we find, sir?

A. This tab is the notice of the hearing today. And attached to that is our application for the case today.

Q. As part of this filing, Mr. Creekmore, did

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you assume the responsibilities for sending notification of this application to interested parties?

A. Yes, we --

Q. How did you determine who those parties were?

A. We secured all the operators that are currently operating in the Basin-Mancos in the San Juan Basin. We secured those names and addresses. And -- from the NMOCD files themselves, and then we sent notice to each and every one of them.

Q. Was that notice in the form of this notice letter dated May 17?

A. Yes.

Q. And it also included a copy of the application?

A. Yes.

Q. So when we turn to Tab 2 of the exhibit book, what is compiled behind that tab?

A. This is what we received from the post office verifying that the operators in the Basin-Mancos in the San Juan Basin were all -- all received notice.

Q. Would you turn to what is marked as Tab

Number 3?

A. Yes.

Q. Let's take a moment -- and first of all, you have a small copy of this large map?

A. Yes. This map indicates the Basin-Mancos and also the existing pools that are in the Gallup, Dakota, Mancos, and deeper pools in the San Juan Basin. And it was compiled by Hopkins Map Service on our behalf.

Q. What is the approximate dataset -- the data, this dataset, that was used in compiling the map?

A. Mr. Hopkins used OCD orders to compile the current outlines for each of the various pools.

MR. KELLAHIN: Mr. Examiner, it's very difficult to read the small map, if you desire to do so. It's not essential for our presentation, but for your further reference, there's a foldout copy of a large map.

THE WITNESS: This is the same map just in a larger form, sir.

CHAIRMAN BROOKS: Okay.

Q. (By Mr. Kellahin) So that the Examiner knows what he will examine, and without going into great detail, summarize for me what you have

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displayed on this map.

A. This map is, like I described the smaller map, it's the same map except a larger size. And it shows all of the -- actually, the Basin-Mancos, Mancos Gallup pools and Dakota pools in the San Juan Basin.

CHAIRMAN BROOKS: I want to thank you for preparing this map. This will be of great assistance to the NMOCD even after this case is completed. So...

Q. (By Mr. Kellahin) When we look at the map, for example, Mr. Creekmore, and we want to use it as a reference, can we make assumptions about the fact that in the absence of the color coding and the names, everything else within this area will be in the Basin-Mancos gas pool?

A. Well, everything north of McKinley County is in the Basin-Mancos. The purple outline that goes around, basically, San Juan County and Rio Arriba County and one section in Sandoval County is the Basin-Mancos. The Basin-Mancos pool is outlined within that purple outline there.

Q. So if we go south, outside the purple boundary, then we pick up more information about other pools?

A. Yes, other pools south of the Basin-Mancos.

Q. Is there a way to look at this map and also see where the Federal numbered units are? Can you do that with this map?

A. They are outlined, also, in blue outline. Yes, they are.

Q. It gets a little hard to do, but let's see if we can do it.

Look over at the West Lindrith Gallup Gap, Gallup Dakota pool --

A. Yes.

Q. -- in the purple there. Do you see it?

A. It's -- yes. It's 24 north, 2 and 3 -- well, 24 and 25 north, 2 and 3 west.

Q. Now, when I look in the southeastern portion of that pool, then I see an area that's got a blue dotted line --

A. Yes.

Q. -- scribed around certain acreage.

A. Yes. And that's --

Q. What would that represent?

A. That is the outer boundaries of the Lindrith pool -- or the Lindrith unit, I'm sorry.

Q. So similarly, you can use that methodology

to help you locate the other Federal numbered units within the map area?

A. Yes, you can.

Q. Let's set this map aside for a moment.

Let's begin to deal with the specifics of the order I described a while ago when I referenced an order issued in the fall of '08 as a rule that adopted the special rules and regulations for the Basin-Mancos gas pool.

A. Yes.

Q. Do you have a copy of those pool rules in your exhibit book?

A. Yes. Under Tab 4 you have the entire order, R-12984, which designated the Basin-Mancos gas pool.

Q. As part of that process did the division, as the applicant in that case, ask for things other than the creation of this pool?

A. Yes.

Q. What else did they ask for?

A. Well, under -- well, they asked for pre-approval for downhole commingling.

Q. And was that authorized?

A. No, it was not.

Under -- I highlighted that under Tab 6

under the order of Rule 5. I -- and the bold is mine, where the application for pre-approval of downhole commingling is denied. The underlying denied is -- was in the rule itself, but it was without prejudice to any new application for pre-approval that the division or an operator may file as a hearing application, and that's why we're here today.

Q. Very good, sir.

When we turn past the order itself under Tab 4 and look at Tab 5, was there any -- have you reviewed the transcript of this case and the exhibits?

A. Yes. Steve Hayden -- Steven Hayden, the district geologist for the division in District 3, out of Aztec, was -- made the presentation.

Q. Was he the only witness?

A. To my knowledge he was the only witness, yes. According to the order he was the only witness.

Q. What's your understanding of what he was trying to do with the consolidation of these various portions of the Mancos group of formations?

A. Well, my understanding is that he wanted one gas pool to encompass the entire basin that was

not already subject to Gallup or Gallup Mancos or Gallop Dakota pools.

Q. In that process, how did he treat the subdivision of the Mancos that's described as the Gallup interval?

A. Let me point out under his testimony 3B, under this Tab 5, first of all -- and I highlighted some of the areas that I thought were germane to what we're trying to accomplish today.

He stated the Mancos formation has often been incorrectly called the Gallop. And then he went on to -- to describe that the Gallup formation is not present in most of the San Juan Basin, but there are several existing pools that are called Gallup in the -- in the basin.

Q. Did he set up a process within the rule and the special rules whereby there was a transition area created between the Basin-Mancos and the existing Gallup pools?

A. Yes, he did. Under the -- well, the special rules had a transition area under -- if you go back to Tab 4 under Exhibit A, there is a B exception on a transition period or transition area.

Q. But my point is, there's buffer zones or transition areas created for the Basin-Mancos to

inter-react, then, or finger, with existing Gallup pools?

A. Yes.

Q. And there's a complexity to that entire process?

A. Yes, there is.

Q. That's not the focus of what we're doing here?

A. No.

Q. Turning past the summary of Mr. Hayden's testimony, then, you've got the part that describes the opportunity to come back for pre-approval for downhole commingling.

And then we get to a Tab 7, and you've created a spreadsheet, have you not?

A. Yes, I have.

Q. What was your purpose here?

A. I wanted to show alphabetically all of these pools that are shown on the map that include the Gallup or the Mancos formation throughout the basin.

Q. These are organized alphabetically?

A. Yes. And some of them are alphabetical with the west or the south or the east put at the end.

Q. Well, let's take an example. If you read down and you find -- see the Baca Gallup, this is designated as an oil. And if you find that row and you read across, and then you get a column that has an order number. And in this case there is no order number, right?

A. No. I was unable to locate some of the order numbers. I did this from NMOCD online, and I was unable to get over here to Santa Fe and find all of the orders.

But piecing together various information that I had, I did the best I could. Some of these gas basins -- the orders, some of them, I could not locate.

And then the next column, the gas basin, the oil basin, I did the best I could with what information I had, or as it had been --

Q. Is it fair to characterize this as a work in progress?

A. Yes.

Q. When we get over to the column that is headed -- and I would call this a green-shaded color --

A. Yes.

Q. -- it says "Pool Modification."

A. Yes.

Q. And for the Gallup -- for the Baca Gallup you have the word "Expanded."

What does that mean?

A. Well, if you go back to Tab 4, the order, quite a bit of the body of the order goes into Number 3 and Number 4, where the NMOCD contracted I think approximately 15 -- I've got that someplace. They contracted 14 or 15 of the various Gallup -- Gallup Dakota pools in the basin.

Q. So the header would indicate that in the Basin-Mancos order itself they took further action to deal with some of the Gallup pools?

A. Yes. It appeared that Mr. Hayden wanted to lock in these pools at the time that -- and then the order reflected that.

Q. And so when there is a colored notation in that column, that represents what you have found in relation to the Mancos order --

A. Yes.

Q. -- whether that existing Gallup pool was expanded, contracted, or some other action taken?

A. Yes. Under 4 in the order, it expanded. And then under 3 it contracted, and I reflected all of those on this column -- or in this column.

Q. Let's turn past Exhibit 7. Exhibit 8 is blank. And then if you'd look at 9.

Have you compiled, starting with Exhibit 9, responses for companies that have sent letters to you concerning your application today?

A. Yes.

Q. And what has been those responses?

A. We received a letter from WPX, which was formerly Williams in the basin, giving support for our application today.

Q. Does WPX Energy, that was formerly Williams, do they operate any of these Federal units?

A. Yes, they do.

Q. And which one is their principal unit?

A. The Rosa unit.

Q. Have they achieved approval to downhole commingle the Mancos pool with Mesaverde in Gallup?

A. Yes, they have.

Q. And do you have a copy of the order that allowed them to do that?

A. Under Tab 10 I have a recent order from the NMOCD, R-12991, which reflects Williams Production Company, LLC's, approval of downhole commingling within the Rosa unit of the Laguna Seca

Gallup pool under -- it's under Rule 5 on page 2. The Laguna Seca Gallup pool, the Cedro Gallup pool, the Willow Gallup pool, and the Basin-Mancos gas pool.

Q. In addition to Williams, did other companies provide letters of support to your application?

A. Yes, they did.

Q. And looking behind Tab Number 11, what do we find?

A. Energen also sent a letter of support for our application today.

Q. To aid the Examiner in his review of this topic, have you included other division orders in this exhibit book?

A. Yes, I have.

Q. Turn to Exhibit Tab Number 11 and describe what you placed in the book.

A. This was the initial order allowing for downhole commingling in the -- that affected our pools in the San Juan Basin.

CHAIRMAN BROOKS: I believe you said 11. That's 12, right?

MR. KELLAHIN: I'm sorry. I misspoke.

Q. (By Mr. Kellahin) Behind Tab 12, then, if

you'd turn to page 5 of that order -- it's not the page of the order, but it's page 5 of your exhibits.

A. Yes.

Q. There is a provision of the order that talks about pre-approval.

A. Yes.

Q. That is the procedure you're following in today's hearing process?

A. Yes, that's -- that is.

Q. If we turn behind Tab 13, what do we find behind that tab?

A. Well, that order that was -- or the reference in that order to the rules eventually became, and currently is, under Chapter 15 Part 12. And you go down, and the pre-approval language is the exceptions -- well, the downhole commingling portion of that begins on 19 15 12 11. And these are copies of the current NMOCD rules.

Q. When we turn to Tab 14, what are you introducing in the book at this point?

A. Well, this is an actual C-107A that a -- a blank copy of it, and then one that we have actually submitted.

Q. For the Examiner's reference, then, Exhibit Tab Number 14 would give him a real-life

example of the type of filing you currently have to do --

A. Yes.

Q. -- in the absence of having the pool a pre-approved pool?

A. Yes.

Q. To illustrate the complexity of these filings, can you direct us to the page that begins the list of parties to whom you send notification?

A. Well, in addition to the pre-approval you can see that when you have to give notice, especially in a participating area in a Federal unit, there at the end of this are five pages of parties that we have to give notice to in this particular -- with this particular well. So it becomes quite cumbersome to give notice on the C-107As -- or the downhole commingling, I'm sorry.

Q. Well, that notification problem is a topic for a different hearing on a different day, is it not?

A. Yes, it is.

Q. What we're asking for today does not ask the division to give us pre-approval to delete notification to interest owners?

A. No, it does not.

Q. What we're asking for is the pre-approval of certain other exceptions that the technical people have to comply with?

A. Yes.

Q. In your opinion, Mr. Creekmore, as an expert petroleum landman, do you think the granting of this application would be in the best interest of conservation and the prevention of waste and the protection of correlative rights?

A. Yes, I do.

MR. KELLAHIN: We tender Mr. Creekmore's Exhibits 1 through 14.

CHAIRMAN BROOKS: 1 through 14 are admitted.

MR. KELLAHIN: That concludes my presentation of Mr. Creekmore's testimony.

CHAIRMAN BROOKS: Thank you.

I actually don't think I have any questions for Mr. Creekmore. The issue of what the significant -- well, I do have one.

This would apply to downhole commingling of oil as well as gas, right, oil production?

THE WITNESS: It would refer just to the Basin-Mancos.

CHAIRMAN BROOKS: So the Basin-Mancos gas

pool?

THE WITNESS: Yes.

CHAIRMAN BROOKS: So it would only apply to oil, to the extent that liquids were incidentally produced from a well that is classified as a gas well in the Basin-Mancos pool. Is that correct?

THE WITNESS: That would be my assumption based on the facts, yes.

CHAIRMAN BROOKS: Yeah. And this order -- this Basin-Mancos order was not particularly well drafted, which I can say because I drafted it. But I -- we have been -- we've had some internal discussions, and I think we're reasonably convinced that the Basin-Mancos gas pool is the appropriate classification only for gas wells. It's not entirely clear in every case how you determine what is and isn't a gas well, but that is all the issues.

MR. KELLAHIN: It is, Mr. Brooks. Mr. Catanach and I have struggled with that, and that's a topic for a different hearing on a different day, but it is a problem.

CHAIRMAN BROOKS: Okay. Well, thank you.

I don't believe I have any other questions for the witness.

CHIEF ENGINEER EZEANYIM: I have a

question for you.

I know David just said he didn't draft the order very well. But the order is written as an order, whether it's drafted very well or not.

You are here trying to convince us -- I don't know if you are able to answer my question, because I have a bunch of them to ask -- maybe you or an engineer or a geologist -- to convince us that the order we issued should be reverted. We denied it based on the information that we received at the time.

I'm hoping that after you present your hearing today you're going to convince us to the contrary what was presented by, you know, the witness at the time that this order was drafted. And that's what I'm looking for.

I don't know whether you're going to be answering my questions or the geologist is going to be answering my questions or the engineer is going to answer my questions.

But what I want to hear is this. This is what we were presented in 2008, and this is new evidence that demonstrates that we could pre-approve these three pools. And according to what Mr. Brooks said, I don't know if -- you are talking about gas

only. You're not including oil, because as we speak now, there are other prospects for oil in the Mancos.

Are you going to include oil in the Mancos for this downhole commingling application you're seeking? Because that's a different animal in itself. If you're talking about gas, then we'll get into gas. I am not even talking about oil.

So I don't know what you -- because I want to clear it up, so that when you come forward to present, let's understand what you're saying.

If you want to include oil that's a different thing. If you want -- if it's only gas that you want to get pre-approval, then that's different. So I wanted to make that clear.

So that as we proceed today, are you -- you might be thinking about what I just said. Because I -- like I told you, even though as proposed, we can clarify oil or gas in the Mancos. And we could -- you know, if we do it, then we could clarify that. It's difficult, but we could do it.

But I wanted to make sure what you're asking for without either a blanket of oil and gas in the Mancos, Mesaverde, and Dakota should be commingled. We need to look at a lot of things.

MR. KELLAHIN: Mr. Ezeanyim, may I respond, sir?

Mr. Ezeanyim, may I respond, sir?

CHIEF ENGINEER EZEANYIM: Okay. Go ahead.

MR. KELLAHIN: There was no technical evidence presented by Mr. Hayden at the first hearing. He simply asked for downhole commingling with no technical support. It was -- he did not ask for, and no company came forward with their own data. We're now coming before you with our data because there was nothing for you to look at.

In regards to the gas/oil thing, Mr. Catanach and the technical people with Conoco and I have examined the gas well/oil well problem. And we believe it's highly unlikely that you're going to find an oil well in the Mancos. The gas/oil ratios are going to be so low that we will not have a well that is a true oil well.

In those pools where there is a higher opportunity for oil production, they are already captured within the boundaries of existing Gallup pools. And as we talk with the geologist about the organization of the Mancos, he can describe for you areas where the likelihood of more oil production is more prevalent.

But in terms of downhole commingling, we believe we're setting up the opportunity to take that well bore, in its commingled fashion, where you're not going to see Mancos portions of this commingled qualifying as an oil well.

But all the technical answers are available from the next two witnesses.

CHIEF ENGINEER EZEANYIM: Okay. I'm very, very excited when I have some operators come in for prospecting for oil in the Mancos.

MR. KELLAHIN: I think we can answer those.

CHIEF ENGINEER EZEANYIM: Okay. Yeah. So in that case I was excited, because I don't want the gas, I want the oil. So if they come in saying we could get oil in the Mancos, that's good.

MR. KELLAHIN: And we're always excited to be here.

CHIEF ENGINEER EZEANYIM: And so in that case I begin to wonder because, you know, I'm not operating there. Only you guys know that. So that's why if there is oil there, and I don't want them to be commingled with the gas, so it's up to you now to demonstrate that there's no oil there. I don't know what those companies are doing. Maybe

they're wrong.

MR. KELLAHIN: In most instances what you would call oil is really a condensate, and we're dealing with condensates and not a true gravity oil.

CHIEF ENGINEER EZEANYIM: I understand that.

MR. KELLAHIN: There will be a difference that they can explain.

CHIEF ENGINEER EZEANYIM: Very good. I think I will defer some of the questions later and not ask Mr. Creekmore, if there are other witnesses you're going to call.

CHAIRMAN BROOKS: Yes. The point Mr. Kellahin makes is -- is well taken, as I can speak from having drafted this order.

But the reasons that pre-approval of commingling was denied in this previous order was not because of the evidence that was presented; but, rather, because of the evidence that was not presented. The rule on pre-commingling specifies certain things that have to be proven before we can issue a pre-approval order, and there simply was not evidence on many of those points produced here.

Okay. I have no further questions.

CHIEF ENGINEER EZEANYIM: No more

questions.

MR. KELLAHIN: With your permission, Mr. Examiner, there is a part of the exhibit book I overlooked. May I proceed?

CHAIRMAN BROOKS: You may proceed.

Q. (By Mr. Kellahin) Mr. Creekmore, if you'll look at Tab 7 and look behind the three pages of tabulations, there are some maps, and I have neglected to ask you about the maps.

Let's start, then, on what is marked page 4. Will you explain to the Examiner what you're depicting on page 4 and behind Exhibit Tab Number 7?

A. Actually, page 4 is based on Column 6 that goes throughout the spreadsheet. And these are pre-approved -- already pre-approved downhole commingled pools within the San Juan Basin.

And of course up in the right-hand side is the Rosa unit that I referred to earlier that -- that not only approved downhole commingling -- pre-approved downhole commingling in the Basin-Mancos, but several other pools. So you can -- this was prepared to show you that downhole commingling has already been pre-approved in numerous of the pools in the basin.

Q. Then when we turn to page 5, what are you showing on this map?

A. Well, in addition -- and it's questionable what color it is, but we think it's blue or a light blue. We've also included the combined Gallup Dakota pools within the basin which in and of themselves are pre-approval for downhole commingling when you have these Gallup Dakota pools.

So even further evidence that pre-approval has already been granted by the commission -- by the division throughout the basin.

Q. And when you go over in the lower left side, there is a block that has some identification codes.

A. Yes, uh-huh.

Q. When we look at the light-colored, those are the pre-approved pools for commingling? Do you see a code at the bottom, the last code?

A. Oh, yes, uh-huh. The pre-approved are the yellow and the blue is the Gallup.

Q. And then above that you have a series of circles with different colors.

What does that represent?

A. Those are the various company operators of those wells.

Q. And the point is, you're trying to identify those areas in which there is a data point that represents an opportunity for the technical people to have information about commingling?

A. Yes, uh-huh.

Q. And what do the red triangles represent?

A. The red triangles are at the very top, and they're tri-mingled vertical wells that are proposed in 2012 through 2014 by ConocoPhillips.

MR. KELLAHIN: That concludes my redirect of Mr. Creekmore, Mr. Examiner. Thank you.

CHAIRMAN BROOKS: Thank you. I have no further questions.

Mr. Ezeanyim?

CHIEF ENGINEER EZEANYIM: You may step down, sir.

ZACK SWANEY,

after having been first duly sworn under oath, was questioned and testified as follows:

EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Swaney, for the record, sir, would you please state your name?

A. My name is Zack Swaney.

Q. Where do you reside?

A. Farmington, New Mexico.
Q. What is it that you do?
A. I'm a geologist.
Q. On prior occasions, have you testified as a geologic expert?
A. I have.
Q. And by whom are you employed?
A. ConocoPhillips.
Q. And in what capacity?
A. As a geologist. I have, for the last almost three years, worked in the Mancos.
Q. As part of your Mancos responsibilities for your company, have you reviewed the details to assist the engineer in examining the opportunity for downhole commingling of the Mancos?
A. Yes, I have.
Q. Generally, is that to be done in association with production from the Mesaverde and the Dakota?
A. That is true, yes.
Q. Based upon that study, do you have recommendations to the Examiner about the application today?
A. I do.
Q. Are you here to support the pre-approval

of the Basin-Mancos gas pool with regards to certain components of the pre-approval process?

A. Yes, I am.

MR. KELLAHIN: We tender Mr. Swaney as an expert petroleum geologist.

CHAIRMAN BROOKS: So qualified.

Q. (By Mr. Kellahin) Mr. Swaney, let's start with the basic format of what it is that you're looking at in the Mancos.

Is there an aerial description of the Mancos that you can give for us?

A. Yes. Broadly, that -- well, it's marine deposition. And in marine deposition, generally what you expect is a large degree of lateral continuity which I think is exemplified within the Mancos.

Q. Why, as a geologist, should lateral continuity be of importance in a commingling environment?

A. It speaks to geologic inference. If you have data points that are separated by several miles or even 10s of miles, those data points in a -- in a marine environment will -- you can infer that those data points speak to a large -- to a large area, so you can basically interpolate between them.

Q. When we turn to the exhibit book and look behind Tab 15 on page 1 of that tab, it starts off with four bullet points.

A. Yes.

Q. Is this your work product?

A. Largely, yes.

Q. What are you trying to indicate for us?

A. I'm trying to describe the specific stratigraphy within the Mancos, first placing it in an overall -- in the overall setting within the Cretaceous stratigraphy. And I'm trying to show how those logs appear, what changes occur across the basin as well as the degree of consistency across the basin within the Mancos.

Q. Okay. As a geologist concerned with the topic of pre-approval of the Basin-Mancos for commingling, what are the kinds of things that worry you?

A. Generally, with -- it's just broadly, not specific to the Mancos. But the concerns that you would have are -- fluid compatibility, I think, would be a very large one.

If you have extremely variant mineralogies, for example, that's going to influence the waters, the type of brines that exist within the

porosity. And so in some cases if you mix those waters you can have porosity occlusion by precipitation of minerals and that sort of thing and cause production problems as well.

We find none of those problems within the Mesaverde, Mancos, or Dakota.

Q. Let's begin, then, to describe the Mancos container aerially, and then we'll look at it in a vertical sense.

Can you turn to Page Number 2?

A. (Witness complies.)

Q. Describe for us what you're showing on this display.

A. This is a modified version of a stratigraphic cross-section from southwest to northeast across the entire San Juan Basin.

Q. Take a moment and show us the orientation of the cross-section by looking at the upper left-hand corner of the display.

A. Yes. That's our key map. It shows in red the outline of the productive portion of the San Juan Basin.

This black line should actually extend farther down towards Gallup, New Mexico, which would be roughly at the corner of the Zuni uplift here

labeled, say, the northwest corner of that.

So the cross-section goes basically from Gallup all the way roughly to Durango, around in that area.

Q. Now the colored section, the larger portion of the display, the far upper left-hand -- the right-hand corner of the display says north?

A. Correct.

Q. So if we take this whole colored display and orient it on the layover of the cross-section line, that would be the orientation of the cut?

A. That's correct.

Q. I would like to start our conversation by having you look at the colored sections of the Mancos and find the area that you have shaded in yellow and identified as the Gallup sandstone.

A. Okay.

Q. Describe for us what we're seeing there.

A. Okay. What we're seeing is the Gallup sandstone as it exists in Gallup, New Mexico, where the typed section is.

And the main point to make about this is that -- the dotted line that exists above it. This dotted line is a nonconformity, which is a surface of erosion or nondeposition.

In this particular case it's a surface of erosion. There was a drop in sea level that exposed this to -- well, subaerially, and then eroded off a good portion of the section.

In this case it eroded off the Gallup sandstone completely south of the San Juan Basin. The implication of that interpretation, which again is not mine. It's from a published paper in 1992, and many others have supported this work.

The implication of that interpretation is that there is no Gallup formation within the San Juan Basin, or at least in the productive portion of the San Juan Basin.

Q. When we look at this container --

A. Yes.

Q. -- and we've got it positioned in the San Juan Basin, is there a tip or a grade or a structure to this container?

A. Yes. The San Juan Basin is generally shaped like a bowl. It has steep -- steep sides on the east, the west, and the north, and a long slow low-dipping slope to the south that gets shallower as you come to the south called the Chaco Slope.

Q. Mr. Ezeanyim expressed concern about the separation of dry gas from wet gas and oils in the

Mancos.

A. Yes.

Q. Can you answer -- use this display to begin to answer his concerns?

A. I believe I can, yes.

Q. Let's do that.

A. Generally speaking in the San Juan Basin, thermal maturity is what controls the presence of various hydrocarbon systems.

CHAIRMAN BROOKS: What is that?

CHIEF ENGINEER EZEANYIM: What is that?

THE WITNESS: Thermal maturity, how hot the shales --

CHAIRMAN BROOKS: I thought you said "thrown maturity."

THE WITNESS: I'm sorry. Thermal maturity.

A. What we find is that the deepest portions of the basin are hottest, which makes sense, by geothermal gradient.

And as you come up to the south, and actually in all areas from the center of the basin, you move from those hottest temperatures to cooler temperatures. And as do you that, you go from a completely dry gas to the center -- in the center of

the basin to a condensate, or wet gas system, in somewhat of a thin band around the basin.

And then as you move outside of that, again mostly to the south, you move into an oil window, where we expect to have an oil system.

There is a -- there is a migration overprint to this. Largely speaking, thermal maturity does control the occurrence of various hydrocarbon systems. But in some cases we find condensate, or wet gas systems, outside of what should be the thermally mature -- the thermal maturity of the condensate, meaning that we find condensate pools in what otherwise looks like an oil window.

And that, we -- we -- our interpretation of that is that we've had migration updip of the lighter hydrocarbons from the condensate systems into pools updip.

Q. If you are looking at a portion of the Mancos that has a container that has oil in it --

A. Uh-huh.

Q. -- is there a relationship to those oil containers that you can ascribe to what Mr. Creekmore presented in the big layout map that was presented behind Exhibit Tab Number 2 -- I'm

sorry, Tab Number 3.

A. Yes. You are talking about the large map?

Q. Yes, sir. Is there a relationship to what would be a conventional oil pool container in relation to the pool scribed on the big map?

A. Yes. I think the best place to start is probably actually outside of the San Juan Basin proper on the Four Corners platform, which is basically just saying we're going to be on the other side of the Hogback monocline.

So this Many Rocks pool, the Horseshoe Gallup pool, Verde Gallup pool, all of these pools are dominantly oil pools.

CHAIRMAN BROOKS: And where are you on the map?

THE WITNESS: I'm sorry. On the northwest.

CHAIRMAN BROOKS: I found it. Thank you.

THE WITNESS: Okay.

As you come down into the San Juan Basin, the Cha Cha pool, Gallegos Dakota, Bisti and South Bisti, these are oil pools as well as the West Lindrith, the West Puerto Chiquito, Gavalin, Mancos, and so on.

If you start from, say, Devil's Fork and

West Lindrith and move north --

Are you following me?

CHAIRMAN BROOKS: Not really.

THE WITNESS: Okay. So in 25 and 6, Devil's Fork Gallup associated pool. It's purple.

I'm sorry. I've now moved into the basin. Look a good bit to the southeast of where you're looking now.

CHAIRMAN BROOKS: Oh, okay.

THE WITNESS: Yes. Sorry.

CHAIRMAN BROOKS: Here's the Devil's Fork. That's way over on the line between San Juan and Rio Arriba.

THE WITNESS: Right. So if you connect where I was before at Horseshoe Gallup to Devil's Fork, West Lindrith, Gavalin, Mancos, West Puerto Chiquito, these pools off to the east, that basically describes the oil rim, the oil window of the San Juan Basin-Mancos.

If you start at Devil's Fork, move to the north of there and go to Largo Gallup gas pool, South Blanco, toes-to-toe, that trend right there, we are getting into more of a condensate type production.

And what I am describing is not based on

thermal maturity. What I'm describing is based on the production from these pools as I remember.

And then when you move north of that into what used to be LaJara Canyon, but is -- I believe that's been dissolved -- and Laguna Seca to the north, that's when you get more into the dry gas rim -- or dry gas window of the basin.

Q. (By Mr. Kellahin) Mr. Swaney, is it fair to characterize the occurrence of the pockets of oil containers as already being controlled within existing Gallup pools?

A. Within certain sands, that is true, and we'll get into the specific stratigraphy. But just to kind of tee that up, these linear trends that you see, for example, Bisti, Lower Gallup, these pools that have this very strong linear trend to them are controlled by a single group of sands. In most cases, the one individual pool will be the result of one individual sands production.

And those are termed Tocito, or toes-to-toe -- used to be called Gallup -- they actually exist within the Niobrara, which we'll discuss in a moment. That -- those sands are generally delineated already by these pools.

Q. In coming back to Mr. Ezeanyim's concern,

then, as a regulator, if he allows the Basin-Mancos entirely, at pool, to qualify for commingling on a pre-approved basis, is he creating a problem for himself in administering gas and oil wells within that process?

A. I don't believe so. I believe that the wells between these pools that are going to be completed in a zone called the El Vado, which is above these main sands, I believe that it will not be difficult to tell that those are oil or that those are gas.

Q. What is the exploration strategy of your company and others with regards to how they are going after this Mancos? How do they do this?

A. Generally speaking, what we are targeting is the zone above these sands, which is the El Vado. And like I say, we've got figures to describe this better.

Q. Are these standalone Mancos wells?

A. Oh, no. No, these are not standalone wells.

Q. How is it done, then?

A. It's done by commingling them with Mesaverde and Dakota.

Q. Why is that done?

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A. That is done because the Mancos is a marginal producer and will not carry the cost of a well in an economic fashion.

CHIEF ENGINEER EZEANYIM: Excuse me.

THE WITNESS: Yes, sir.

CHIEF ENGINEER EZEANYIM: Very good questions. But I am still looking for an answer.

The question was asked: Why shouldn't I be concerned about the oil and gas? Like I said, I don't know what your answer was. I was trying to see what you said there to convince me what all should happen if you have oil and gas there. You said you didn't believe so.

Why? Why didn't you believe so?

THE WITNESS: Well, I didn't believe that there would be a problem, is what I said.

CHIEF ENGINEER EZEANYIM: Okay. Yes. Why?

THE WITNESS: Not that there would be oil.

CHIEF ENGINEER EZEANYIM: Okay.

THE WITNESS: There will be oil between these pools.

CHIEF ENGINEER EZEANYIM: All right. Why is it not going to be a problem?

THE WITNESS: Because I believe -- well,

it depends on how the rule is handled, which I think has some question marks in and of itself at this point.

CHIEF ENGINEER EZEANYIM: Uh-huh.

THE WITNESS: But I don't believe it's going to be difficult to tell whether or not you have an oil system or a gas system in the Mancos.

And so I don't believe that there will be issues with seeing the difference.

CHIEF ENGINEER EZEANYIM: Go ahead. I'm sorry.

Q. (By Mr. Kellahin) Let's look at this container. There's a structural component to it. There's a slight --

A. Yes.

Q. -- there's a bowl shape with a slight tip to it?

A. Yes.

Q. Does that give you an answer to help the engineer, when he does the pressure information, to explain why he's seeing a certain pressure regime in the Mancos in relation to the Mesaverde or the Dakota?

A. Yes.

Q. And what would that be?

A. What we expect, with greater depth we get greater pressure. And the stratigraphy of the Mesaverde, Mancos, and Dakota are such that they -- they get deeper together. And so you don't expect different gradients between them at any portion of the basin. So if there -- if one is higher, the others are higher in conjunction with it.

Q. Let's turn and look at the containers in a vertical sense.

If you'll look at page 3 with me.

A. (Witness complies.)

Q. When we talk of the Mancos as a formation, it really is an accumulation of various subdivisions?

A. True.

Q. And describe for us how they are organized.

A. Okay. You will find many different terminologies, terminology sets, associated with the Mancos. This is how we see it.

We define the base of the Point Lookout as the top of the Mancos and the top of the Greenhorn as the base of the Mancos. So those are the bounding surfaces of the overall Mancos group.

Within that we divide it into the upper

Mancos, the Niobrara and the Carlisle. The Niobrara is then subdivided into the El Vado, which has its own subdivisions, as you can see, and the base of the Niobrara. It is within the base of the Niobrara that the Tocito sandstones exist that I was discussing earlier with respect to the Bisti Gallup pool and so on.

The base of the Niobrara is that unconformity I was speaking about in the previous figure. It separates Niobrara-age rocks, which the dominant -- is the dominant producer in the Mancos, both historically and what we see as a future target. It separates the Niobrara from the Carlisle.

Below this unconformity, especially in the southern portion of the basin, we see rocks that are -- I call them Gallup equivalent. They don't contain sandstones, but they are the lateral extent of the Gallup formation.

Below that we have the Juana Lopez, also called the Sanostee, and the Lower Carlisle.

Q. When the engineer takes the dataset of pressure information, for example, from all of these data points spread throughout the basin in the Mancos and looks to see where, in fact, that data

comes from, generally, where would he find this on Exhibit Number 3?

A. The pressure data that --

Q. Yes. Where does that come from?

A. Generally, that comes from the overall Niobrara. The lion's share of the perforations within the Mancos field-wide are within the Niobrara regardless of whether it's called a Gallup pool or not.

Q. Is the term "Gallup" equivalent to the Mancos? That's not synonymous, is it?

A. No. No, it is not. The -- I've seen multiple type logs from when Gallup was being used regularly as a term within the Mancos. And none of those type logs equate the top of the Mancos to the top of the Gallup, the base of the Mancos to the base of the Gallup. The Gallup formation is always, as I have seen, a portion within the Mancos. That generally correlates to what we would call the Niobrara now.

Q. Is the data, available to the engineer, data that you, as a geologist, would see to be similar data as you would move up and down the different subsets of the Mancos?

A. Yes.

Q. Is there any reason for those to be different?

A. No.

Q. Let's look at your type logs and see if you have a pattern of distribution of your type logs that would give you data information that makes you comfortable, as a geologist, that you've got examples throughout the Mancos in the basin. And starting, first of all, with Page Number 4.

A. Okay. So this is a key map to show you where the individual type logs come from. The first one we'll talk about is in the southeast portion of the basin at Lindrith unit. Then we will move west-northwest to Huerfano unit, and then we will move to the north in Allison unit.

I choose these three areas because I believe that they -- they show good type examples of the appearance of Niobrara-age rock specifically, but Mancos generally, and how they occur in large areas of the basin.

Q. Let's then turn to the type log for the Lindrith on Page Number 5.

A. Yes.

So to first describe what you're looking at on the well log, on the left track we have a

gamma ray. On the right track we have in red the bulk density curve, which we use for porosity. So when the curve goes to the left that is more porosity.

The other is in blue, which is the deep induction curve. That curve is -- we use for a hydrocarbon indicator. When it goes to the right it's indicating that there's more hydrocarbons there.

I have them scaled on this figure such that when the red is to the left of the blue, then that's an indicator that we -- that we like that zone, basically; that there's probably pay within that zone.

Also shaded in green in all three of these will be the El Vado A, B, and C. That is what we consider, generally, our largest target.

So to focus in on the Lindrith unit, here, the unconformity is actually quite high. So -- meaning we have a relatively thick Gallup equivalent section. There's no -- no pay or no production in this area from these rocks.

That also means that our basal Niobrara section is very thin. And the implication there is there are no Tocito sandstones in this part of the

basin. And we, in fact, find none.

The green portion, the El Vado A, B, and C in the Lindrith area, all look like they -- they are hydrocarbon-bearing and look as though they are our targets.

So when we move to Huerfano --

Q. That would be page 6 of Exhibit 15?

A. Yes.

When we move to Huerfano, the unconformity has eroded down a little bit. And so we have a thinner Gallup equivalent section and a thicker base on the Niobrara section.

I chose this particular log because it has a good example of Tocito sandstone in it. These come and go laterally somewhat abruptly. In this case, we have one in the well.

Historically, this is the -- this is where the production first came from the Mancos, within the Tocito sandstones. They are high porosity/high permeability sands that was producible with '50s, '60s, and '70s technology.

Above that is -- highlighted in green again -- the El Vado zone. And here, it's a little bit thicker than it was at Lindrith, and nearly the entire section would qualify in our assessments as

something interesting, something worth going after.

It is worth mentioning -- I do not have perforations listed on this particular well. But in general, when you see a log like this, the Tocito would be perforated as well as the El Vado above. Where you don't have Tocito, traditionally, there was no pool because the El Vado would not produce on its own in economic quantities. Where they have the Tocito sand they would perforate the El Vado as, essentially, icing on the cake, thinking it would pay for its own perforations. And I believe that it probably did.

Q. And turning now to the Allison, on page 7.

A. Yes. So at the Allison unit, the unconformity has, at this point, eroded completely through the Gallup equivalent section, removing it entirely. This is how the unconformity appears at -- in most of the basin; that being that it either erodes out the top of the Juana Lopez or it rides right along the top of it.

Here, we have a different character to the pay a little bit. The El Vado A and B are marginal, at best, and probably not good targets. The C, in fact, is a good target.

What is mostly different about the Allison

and Rosa area -- and this log could have just as easily come from Rosa unit. The log character is very, very similar to Rosa. Here, we have an upper El Vado zone that looks like pay.

The overall point of these three type logs is -- well, the first is to describe differences, like I have done. The other is to point out that you'll notice that on all three figures all of the same surfaces appear. The stratigraphy is consistent enough that you can find the same events in every well log I have correlated in the basin which is, at this point, probably approaching 2- to 3,000.

Q. Let's turn to page 8, Mr. Swaney.

A. (Witness complies.)

Q. What are you summarizing for us here?

A. I'm summarizing here how we view what the El Vado is; that being that it's a silty section within the Mancos that's characterized by high resistivity and characterized by a lower gamma ray signature, although that is not always specifically the case in every well log.

We see that there are possible pay zones in the upper Mancos. And also in the Carlisle we think that there are future targets.

The upper Mancos right now is prob- -- is a target because it does not, at this point, take any technology beyond which that we are -- beyond that which we have to complete that and produce it.

The possible future targets in the Carlisle, we have a lot of difficulty placing our completions in those zones, and so there's not a lot of potential there that could be unlocked right now. But we know it's hydrocarbon-bearing, and we know that with advances in technology, though, that could be a future target.

Q. Let's turn now to page 8, which is your summary using a cross-section.

A. Yes.

Q. And let's take a moment and have you summarize your major geological points insofar as they relate to pre-approval for commingling of this pool.

A. Okay. So on the top left corner I have a key map. Lake Navajo is probably the easiest thing to see, to tell where the cross-section was actually drawn.

CHAIRMAN BROOKS: This is page 9, now.

THE WITNESS: Yes.

A. The point here is to summarize, really,

everything I have already just said, and in a cross-section sense.

The purple wavy line you see throughout the cross-section, that is the unconformity. So you can see that to the south it's -- it's quite high, close to the lower red line, which I call the basal Niobrara wetting surface.

And then as you move to the north it cuts down quite quickly into -- into at least close proximity to the Juana Lopez, if not into it altogether.

The main point here is that over this great distance, roughly about 50 miles, you find the same surfaces that you can correlate. What we say generally about marine rocks, which is what the Mancos is, is that they're locally consistent but regionally variable. And that is borne out in this cross-section.

You can -- you can track the same surfaces, but as you go a long distance you see differences in a lot of character, which I summarized with the three previous logs.

Q. (By Mr. Kellahin) How does that similarity help us make decisions about commingling the Mancos on a pre-approval basis?

A. It's -- it allows you to take data that can be separated by quite a long distance and interpolate between them and make assumptions about what happens in between.

With this level of consistency with stratigraphy, it's a very reasonable thing to do to say that if you have X pressure here and Y pressure here, you will have something in between in the middle.

Q. In terms of data points available to your company, can you approximate for us the total number of wells involved? Do you have --

A. Are you talking penetrations?

Q. Yes.

A. There are over 9,000 data points with at least a gamma ray log that we can use to correlate in the San Juan Basin. A lot of those are Mesaverde Dakota wells that were never completed in the Mancos, but they are data points, nonetheless.

Roughly half of those have some production from the Mancos interval.

Q. Is the fact that your company has an inventory of well bores that have been drilled to the Mesaverde and the Dakota and left unpenetrated -- untested in the Mancos, is that the

opportunity you're looking to advance?

A. Yes, absolutely.

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

We move the introduction of his exhibits behind Exhibit Tab 15. They're pages 1 through 9.

CHAIRMAN BROOKS: Okay. Exhibit 15 is admitted.

CHAIRMAN BROOKS: I will invite Mr. Ezeanyim to cross-examine first and I'll follow up, I think.

CHIEF ENGINEER EZEANYIM: What is your name again?

THE WITNESS: My name is Zack.

CHIEF ENGINEER EZEANYIM: Zack, yes. I'm thankful of your testimony here. At least you know what we're trying to do. I mean at least the intent, anyway, of what you have to say about this Mancos.

Of course all we're trying to do here, we're having to consider to commingle. We don't know if we'll do it here in Santa Fe. We'll look at all the things you said.

But now you are trying to have us give you a blanket approval. Of course we can do it, if we

think we can do it. You know, we can do it. We still have our procedures here. But my point is that we need to examine these on a case-by-case basis. However, you did a good job of trying to convince us.

One of the questions I wanted to ask you: How productive is the Mancos? Is it prolific or marginal? What is your opinion about the Mancos that we looked at in the geology?

THE WITNESS: It is marginal.

CHIEF ENGINEER EZEANYIM: It's not prolific?

THE WITNESS: No.

CHIEF ENGINEER EZEANYIM: I'm talking about gas.

THE WITNESS: We're talking about across --

CHIEF ENGINEER EZEANYIM: Okay.

THE WITNESS: -- across the spectrum. There are portions that have been prolific. For example, the Bisti toes-to-toe, the Gallegos toes-to-toe, these clean sands that I was describing within the basin Niobrara --

CHIEF ENGINEER EZEANYIM: Yeah.

THE WITNESS: -- those -- some of those

sands, their high porosity and high permeability lends them to prolific production and somewhat wide spacings.

Those are a different animal than what we are left with. I believe that those have all been found and produced to depletion. So what we are left with is relatively unfractured, very tight, very low permeability El Vado zones that are marginal across the basin.

CHIEF ENGINEER EZEANYIM: Okay. I know you talked a little bit about compatibility here. You know, that's also an issue.

THE WITNESS: Yes.

CHIEF ENGINEER EZEANYIM: Can you tell me more about that?

THE WITNESS: Well, my first comment to that effect is -- and I believe Dryonis will maybe speak a little more to this -- is that our experience tells us that there's no real problems.

We have been commingling, for example, the Gallup Dakota pools. Those -- those have been commingled for -- well, since their inception. And we have seen no fluid compatibility issues in those wells.

You could say the same thing at Rosa. Any

of these pools that have been pre-approved, we haven't seen any production issues related to fluid compatibilities. I believe that stems from the fact that Dakota through Mesaverde are -- it's the same source area for the sediments. It's Sevier orogeny is the source area for -- to the west of us -- was the source area for all of the material shed into the -- into this portion of the Cretaceous seaway, which is where these rocks were deposited.

So we have the same source for the whole section, and we have the same seaway depositing all of these rocks.

I think the similarity in the source areas in deposition lends itself to a similarity in the fluids within the porosity.

CHIEF ENGINEER EZEANYIM: Okay. I think I'm -- that concludes what I wanted to ask you for now. I might come up with some other questions later, because I'm still looking for something.

THE WITNESS: Yes.

CHIEF ENGINEER EZEANYIM: I'm looking for applicability, you know, on whether we can approve it or not.

THE WITNESS: Sure.

CHIEF ENGINEER EZEANYIM: But once all of

the testimony has been presented, let me see what we can do.

THE WITNESS: Thank you.

CHIEF ENGINEER EZEANYIM: You can go ahead, Chairman Brooks.

CHAIRMAN BROOKS: Thank you.

Looking at page 2 of your Exhibit 15, the area that you have designated Gallup sandstone on there, is that -- is that the only area that you would -- could -- and the nomenclature that you would prefer for geologic zones, is that the only area that you would actually call Gallup?

THE WITNESS: Yes. On this diagram, that is the only area that I would call Gallup.

CHAIRMAN BROOKS: So where you have shown Gallup on your other exhibits, you're talking about, basically, this stringer, or what looks like a stringer, and -- when you compare it to the overall vertical dimension in your exhibit.

THE WITNESS: The answer there is yes and no.

CHAIRMAN BROOKS: Okay. Please explain.

THE WITNESS: Yes. So the Gallup sandstone, as shown on here, it is actually a true sandstone.

Below it, within the same interval of Gallup rocks, there are -- there are non-sandstones. There are shales and other lithologies.

And what I am showing on mine is not this true sandstone, it's the material that's below that true sandstone.

CHAIRMAN BROOKS: What you're showing now, you're talking about exhibits other than page 2?

THE WITNESS: Yes. So for example, on 3, what this Gallup equivalent is representing is the rocks between the top of the true Gallup sandstone and the top of the Juana Lopez.

CHAIRMAN BROOKS: Okay.

THE WITNESS: Within that package there are multiple lithologies. At the top of it is where this Gallup sandstones exists.

CHAIRMAN BROOKS: Yes. And that Gallup equivalent, then, would that be encountered in a larger portion of the basin than what is shown as the Gallup sandstone on page 2?

THE WITNESS: Yes. It would extend a little bit to the north of that.

CHAIRMAN BROOKS: Okay. Is that a hydrocarbon-prospective formation at all?

THE WITNESS: It is our view that it is

not.

CHAIRMAN BROOKS: Okay.

THE WITNESS: Yes. It is our view that it is not.

CHAIRMAN BROOKS: Now, at the time that these Gallup pools were designated -- I don't know exactly when it was, but it's been quite a long time ago.

THE WITNESS: Yes.

CHAIRMAN BROOKS: That would -- would that have been before the papers were written that explained this -- this geology of this area?

THE WITNESS: I don't know specifically. I know some of them were, yes. I know that the term Gallup, as applied to what should be in my view called the Niobrara, persisted well beyond the understanding that there was no true Gallup in the basin -- in the productive portion of the basin, I should say.

So I don't know if there were pools that were created using that terminology after the understanding of the unconformity or not. But I know that the recognition of the unconformity -- that the lack of recognition of the unconformity early on in interpretations of these rocks is

what -- what colored and created the Gallup pools that we see, or at least some of them that were the earliest.

CHAIRMAN BROOKS: Okay. And if I correctly understood your testimony, although I didn't follow necessarily which was which, you were indicating that some of the production from the existing Gallup pool actually came from what you have identified as the Niobrara?

THE WITNESS: Nearly all of it did.

CHAIRMAN BROOKS: Okay. So then when you go back to Exhibit Number 4, and go to the attached rules, Rule 1B on page 11 of Exhibit 4 states "any well drilled within the Basin-Mancos gas pool."

Now first of all, we've got to figure out what's a well drilled within the Basin-Mancos pool to apply this -- this rule.

But the Basin-Mancos pool is defined by outer boundaries. And if you will take my word for it, as the draftsman, there is really nothing in this pool except Rule 1B that excludes the existing Gallup -- the existing Gallup pools from the Basin-Mancos pool. It doesn't say it's all the land in these counties with the exception of existing pools. It just says it's all the land within these

counties.

THE WITNESS: Okay.

CHAIRMAN BROOKS: So we get to what 1B says: "Any well drilled within the Basin-Mancos gas pool that is to be completed as a standalone oil well in the Mancos formation -- that is to be completed as a standalone oil well in the Mancos formation -- and it's within two miles of the outer boundary of any oil or associated oil pool identified in paragraphs 3 and 4 shall be drilled and spaced in accordance with the rule applicable to -- rules applicable to such pool."

Given the way the -- and I'm explaining a lot of things rather than asking a question, but I'll get to my question once I've gone through this.

Given the way the order is written, that the outer boundary -- that the definition of the Basin-Mancos pool does not exclude the areas that are within the existing Gallup pools, and given that this rule says only that the pool rules for the Gallup pools will govern if a well is within two miles of the outer boundary of the Gallup pool.

If you read this provision literally, it would mean that any well completed -- if you read Rules 1 and 2 literally, you would come to the

conclusion that any well in the existing Gallup pools would be spaced and regulated in accordance with the rules of the Basin-Mancos gas pool; whereas, if they were around the periphery they would be spaced and regulated in accordance with the existing Gallup pool.

That's one of the problems with this order because, you know, the courts have said that you should interpret legislation literally, especially if it makes sense as written. And I would submit, though I wrote this myself, that it really doesn't make sense as written.

And the only way I can make sense of what I wrote here is to assume that any well that is in the Mancos that is an oil well -- and for the time being I'll ignore the difficulty with standalone, because that's problematic, too.

But any well that's in -- that is in an existing Gallup pool that's completed in the Mancos as an oil well is -- is governed by the rules of the Basin-Mancos -- is not governed by the rules of the Basin-Mancos gas pool; but, rather, is governed by the rules of the existing Gallup pool.

Well, that helps us with one thing. It gets rid of the problem of whether -- of what the

actual boundaries of those Gallup pools are. Because if you apply Rule 1B, any well in the Mancos -- and it seems to be fairly well-understood -- it is, is it not, fairly well-understood what the Mancos is? There's not a lot of difficulty about what's in the Mancos and what's not in the Mancos.

THE WITNESS: That is a true statement.

CHAIRMAN BROOKS: Okay. So any well that's in the Mancos that is within the lateral boundaries of a Gallup pool is controlled by the rules for that Mancos pool. I think it's hard to argue with that -- well, I'm sure it's not hard to argue. But that's -- having thought about it for a long time, that seems to me to be the most reasonable construction of Rule 1B.

But the problem is that that's only if it's a, quote, standalone oil well. These wells in much of this section produced both -- both gas and fluid and liquids, correct?

THE WITNESS: Correct.

CHAIRMAN BROOKS: And under OCD rules we have some established gas/oil ratios --

THE WITNESS: Yes, sir.

CHAIRMAN BROOKS: -- that determine

whether a pool is a gas well or an oil well.

Now, leaving aside -- because I don't think we're going to get any answer to it -- what the words "standalone oil well" is, if you assume that you refer to OCD rules to determine whether a well is a gas well or an oil well, are we going to have a problem of -- in applying this rule, that you would have to -- well, let me put it this way.

Maybe this -- this may be a question for the engineer. But I am assuming that with my miniscule knowledge of engineering, that you would have to isolate the Mancos zone in order to determine the gas-to-oil ratio at which the well was capable of producing within the Mancos zone.

Is that your understanding, or do you want to defer to the engineer on that?

THE WITNESS: That is my understanding. But I mean, he will be able to speak better to that than I would.

CHAIRMAN BROOKS: Okay. And since you want to commingle by using a spinner method, my assumption is that you do not contemplate that you will be isolating any of the zones at any point in the development. Is that a correct statement?

THE WITNESS: Aside to -- we have isolated

the Mancos in a few wells -- I don't remember the exact number, but I know we have done it -- where we have completed the Dakota, cleaned it out, placed a plug over it, completed the Mancos and gotten standalone Mancos data on its own for a period of time -- I think three to six months, somewhere along those lines. But it will not be general practice. It will be only in those cases where we are looking for data above and beyond what we can get in a commingled sense.

CHAIRMAN BROOKS: And does that not give us a problem, a regulatory problem, in terms of determining whether or not we're dealing with a gas well that is controlled by the rules of the Basin-Mancos gas pool, including this -- the order that you propose -- or whether we're dealing with an oil well that, under Rule 1B of order R-12984 is controlled by the rules of the oil well in which -- or in the periphery of which it is located?

THE WITNESS: I think I'm going to defer to Dryonis on that question.

CHAIRMAN BROOKS: Okay. That's all I have.

MR. KELLAHIN: Mr. Ezeanyim, did you have any further questions?

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CHIEF ENGINEER EZEANYIM: No questions.

CHAIRMAN BROOKS: Very good. I think the witness may stand down, and I think we need to take a break before we get to the next witness. So let's take a 10-minute break.

(A recess was taken from 9:55 a.m. to 10:09 a.m.)

CHAIRMAN BROOKS: We are ready when you are ready, Mr. Kellahin.

MR. KELLAHIN: Thank you, Mr. Examiner.

Our next witness is Mr. Dryonis Pertuso. Mr. Pertuso is an engineer with ConocoPhillips, and he is our next witness.

CHAIRMAN BROOKS: Very good. You may proceed.

DRYONIS PERTUSO,

after having been first duly sworn under oath, was questioned and testified as follows:

EXAMINATION

BY MR. KELLAHIN:

Q. For the record, sir, would you please state your name.

A. Dryonis Pertuso. D-R-Y-O-N-I-S, Pertuso, P-E-R-T-U-S-O.

Q. And where do you reside, sir?

A. Farmington, New Mexico.
Q. And what is your occupation?
A. Reservoir engineer.
Q. You'll have to speak up in here. There's some background noise in here, at least for me.
As part of your duties as a reservoir engineer, are you involved in the examination of the Mancos formation?
A. Yes.
Q. Generally, what are your responsibilities in association with that formation?
A. Evaluate on performance of the Mancos.
Q. As part of that evaluation, have you made yourself familiar with data in large areas of the San Juan Basin that is within the boundaries of this pool?
A. Yes.
Q. Have you been asked, in association with this case, to focus on certain issues of pre-approval of the Basin-Mancos pool concerning commingling?
A. Yes.
Q. And with regards to that work, do you now have certain engineering conclusions and opinions?
A. Yes.

MR. KELLAHIN: We tender Mr. Dryonis [sic] as an expert reservoir engineer.

CHAIRMAN BROOKS: So qualified.

Q. (By Mr. Kellahin) Let's turn now to the package of exhibits and start with Tab 15, Mr. Dryonis. And if you'll look at page 10 of this, that begins your presentation, does it not?

A. Yes.

Q. The application asks the Examiner to focus on this issue of pre-approval of the Mancos for commingling purposes?

A. Yes.

Q. In terms of commingling, can you characterize the types of well bores that are going to be commingled? Are we dealing with Mancos alone?

A. No.

Q. You're dealing with what, sir?

A. Commingling the Mesaverde, the Dakota, with the Mancos.

Q. As part of that study, have you made conclusions about whether or not the division could preapprove applications without the submittal of additional data with regards to pressure?

A. Yes.

Q. And what is your conclusion about

pressure?

A. My conclusion is that the Mancos is at or below hydrostatic pressure, so it won't pose any threat to the Mesaverde or the Dakota in case of an extended shutin.

Q. When you look at the opportunity for commingling this production, are you seeing any compatibility problems if you were to commingle any portion of the Mancos formation with production from the Mesaverde or the Dakota?

A. No. We haven't found any sign of incompatibility of the fluids between these three formations.

Q. In terms of value of product, do you see any problem in ranges of BTU content if the product is allowed to be commingled with these other reservoirs?

A. No. The BTU content between the Mancos and the Mesaverde and the Mancos and the Dakota is not greatly different.

Q. When we look at the economic components of doing this work, have you satisfied yourself that it's not feasible to drill a well just to the Mancos formation?

A. It will be uneconomic to drill at this

time, alone, under current conditions.

Q. In terms of the allocation of that production, there's available to your company and others various methods of allocation, are there not?

A. Yes.

Q. And what are some of the methods that you utilize?

A. The spinner is the most common method to allocate production from these three formations, and it's what we have been using in our tri-mingle wells.

Q. Let's turn now to page 11. This is a map, now, that -- it's got lots of information. Let's take it in pieces.

A. Yes.

Q. First of all, show us what the underlying base map is, sir.

A. There are five points on -- that I want to convey with this map.

The circle represents wells -- existing wells in the tri-mingles in the Mesaverde, Dakota, and Mancos that have been recently completed by different operators. These wells have been approved by C-107As for the past six years.

Q. Okay. Let's look for an example. Let's

look in the first ellipse -- the first circle, Number 1.

A. Yes.

Q. Within that area, we're up near the Navajo reservoir. And I see various types of data points. What is the varieties of the data utilized in Circle 1?

A. Circle 1, you can see green circles. Those are tri-mingle wells -- Mesaverde, Dakota, and Mancos -- completed by WPX, formerly Williams, over the past six years.

That red dot -- the red dots represent tri-mingle wells that Conoco has completed recently.

And then the triangle -- red triangles represent our future plans for the next three years.

Q. Am I correct in reading this display that the area shaded in the light green, that represents the boundaries of the Rosa unit?

A. Yes.

Q. And for the Rosa unit, the division's already pre-approved the commingling of Mesaverde with the Dakota and the Mancos?

A. Yes.

Q. Why does the circle --

CHIEF ENGINEER EZEANYIM: Excuse me. I

want to interrupt here before I forget it.

Mr. Pertuso, have you ever testified before the division?

THE WITNESS: Yes.

CHIEF ENGINEER EZEANYIM: You have. Okay.

Now, let's go back to that Circle Number 1. You said tri-mingle activity over six years. Is this by pre-approval or approval from the division?

THE WITNESS: There are two different cases. For the case of Williams, those green dots, Williams has received pre-approval in Rosa unit to tri-mingle Mesaverde, Dakota, and Mancos. It is pre-approved, yes.

CHIEF ENGINEER EZEANYIM: What is the order number that approved it?

THE WITNESS: It's in --

MR. KELLAHIN: It's in the book, right?

THE WITNESS: It's in the book, yes. I'm just going to see if I have it in my --

MR. KELLAHIN: It's Tab 10.

CHIEF ENGINEER EZEANYIM: Tab 10? Okay.

THE WITNESS: I want to say 12991.

CHIEF ENGINEER EZEANYIM: Okay. 12991.

THE WITNESS: Okay. Now, back to you. Sorry.

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CHIEF ENGINEER EZEANYIM: Okay. Now, you can continue. I got it.

MR. KELLAHIN: Thank you.

A. Back to your questions, as you can see there are two red dots outside the Rosa, the boundaries of the Rosa unit.

CHIEF ENGINEER EZEANYIM: Yes.

THE WITNESS: Those are tri-mingle wells that ConocoPhillips has recently completed. Those were approved through C-107X.

CHIEF ENGINEER EZEANYIM: Okay. Were approved tri-mingle?

THE WITNESS: Yes.

CHIEF ENGINEER EZEANYIM: Okay. Go ahead.

Q. (By Mr. Kellahin) What accounts for the fact that these areas are grouped in Circle 1?

A. The reason that I grouped them is going to help me to, as we move forward in my -- in my exhibits, I want to show performance observed in the Mancos in these areas. It will help me build on the point that the Mancos is marginal production, and it's going to be uneconomic to produce as a standalone.

Q. Is one of the reasons we're seeing the circle located in Area 1 the fact that there are

existing Mesaverde, Dakota wells for which the Mancos now is tri-mingled?

A. Yes.

Q. And that's why it would be here?

A. Yes.

Q. Is that true of the other three circles?

A. Yes.

Q. You said you had five points you wanted to make about this display. That was the first one?

A. Yes.

Q. What's the next one?

A. If you go the yellowish polygons to the south of the map, that represents Gallup existing pools that are pre-approved to tri-mingle the Mancos with the Mesaverde and Dakota.

CHIEF ENGINEER EZEANYIM: Which ones?

THE WITNESS: The yellow polygons.

CHIEF ENGINEER EZEANYIM: In which circle?

THE WITNESS: The polygons in yellow. Everything in yellow to the south, those are existing Gallup pools.

CHIEF ENGINEER EZEANYIM: Oh, yellow.

THE WITNESS: Yellow, yes.

Q. (By Mr. Kellahin) Your color yellow will appear in each of the four, the yellow color, in

each of the four?

A. Yes.

Q. Now when you go over to the legend, let's make that point. If you go to the lower left corner you can find the pre-approved pools in the yellow color that are further displayed on your bigger map.

Do you see that?

A. Yes.

Q. That's what you just talked about?

A. Yes.

Q. Now, let's talk about the next color up which is -- it looks like a light gray or a light blue.

Do you see that color?

A. Yes.

Q. That is what, sir?

A. Those are Mancos Dakota pools. In essence, these pools are pre-approved to commingle -- in essence, we're commingling the Dakota and the Mancos in these pools.

Q. And with regards to this, it doesn't matter if the pool is a well, a pool that produces oil and gas, or oil and gas from another pool?

A. No.

Q. It's commingled regardless of what label

you put on the product?

A. Yes.

Q. If it's a gas well and an oil well they are commingled?

A. Yes.

Q. And there's a procedure for doing that?

A. Yes.

Q. When you go up to the next color there's a light purple that says "Pressure."

Do you see the color code?

A. Yes.

Q. Now when I look at pressure and look over at the big map, there are going to be areas, rectangular areas, that are shaded in that purple.

What does that depict?

A. Those are existing Gallup pools that, even though they're not approved to commingle the Mancos with the Mesaverde and Dakota, we have pressures in those areas that tell us that the Mancos is at or below hydrostatic pressure. That's the reason I included those there.

Q. Now, over on the lower right-hand side you have a circle?

A. Yes.

Q. That is subdivided. And in the center of

that circle is the Number 144. What does that represent?

A. That represents the number of wells that have been -- that have been completed over the past years by several operators. These are tri-mingled wells in the Mancos, Mesaverde, and Dakota that have been approved by the commission either because they are pre-approved pools or through C-107A.

CHIEF ENGINEER EZEANYIM: Where is the 144?

MR. KELLAHIN: In the center of the blue circle on the right -- bottom right.

CHIEF ENGINEER EZEANYIM: Oh, okay.

MR. KELLAHIN: In the center is 144.

CHIEF ENGINEER EZEANYIM: And what do you say -- it represents what?

THE WITNESS: These are wells, tri-mingled wells, completed over the past six years where we are commingling the Mesaverde with the Mancos and the Dakota.

CHIEF ENGINEER EZEANYIM: These are approved by the --

THE WITNESS: Either pre-approved -- yeah, being approved through C-107As -- or because they fall into pre-approved pools, for example, Rosa.

CHIEF ENGINEER EZEANYIM: Okay. What percentage is on that pre-approval on that 144?

THE WITNESS: You can -- if you go to that chart you can see Williams has 59 wells out of the 144. That represents around 36 percent.

CHIEF ENGINEER EZEANYIM: Okay. And those are pre-approved because it's in the Rosa unit?

THE WITNESS: Yes. The rest have been approved through C-107As.

CHIEF ENGINEER EZEANYIM: But the rest have been approved here in the Santa Fe office.

Is that fair to say?

THE WITNESS: Yes.

Q. (By Mr. Kellahin) This is the population of wells indicated in the gray block -- you say this is your tabulation of tri-mingles in the last six years?

A. Yes.

Q. And you have subdivided it by company?

A. Yes.

Q. Is there anything else about this display that you want to direct our attention to that we have not yet covered?

A. Yes. The red triangles represent ConocoPhillips' plan on doing tri-mingles in the

next three years. Half of those wells have been approved or are being processed by the Santa Fe office.

Q. Let's move to the next topic now, Mr. Pertuso.

If you, as a reservoir engineer, are going to look at the opportunity for gas production in the Mancos, then I think your first building block is to construct some decline curves that would be representative of production throughout the pool?

A. Correct.

Q. So when we turn to page 12, is that not the exercise you are commencing here?

A. Yes.

Q. Rather than go through all of these sets, am I correct in understanding that you have a block that represents two plots, and each pair of plots relates back to the previous map and shows us one of the four areas?

A. Yes.

Q. Let's go to page 12 now, and let's pick a plot that you want to use as an example and describe for the Examiner what it is that you're doing here.

A. What I'm showing here is the actual observed performance of the Mancos in these areas.

If you'll look to the first plot to the left, that's what we have observed in the Williams, in the Rosa unit, Mancos performance.

Q. Now just a minute, now. That's the Number 1 area?

A. Yes, the Rosa unit.

Q. Now before you leave page 12, go down to the bottom. You've got some values here that are shaded in -- highlighted in yellow.

A. Yes.

Q. Would you define for the record what each of these four codes are, starting with the letter B? What does that represent?

A. Yeah. Let me back up a little bit to make a further explanation.

Q. Sure.

A. The blue points represent actual production.

The red line is our history match and forecast, which is the performance that we should expect in that area for the Mancos.

The table on the bottom of those plots is just expressing the same red forecast in decline curve analysis parameters.

The B factor is the hyperbolic

coefficient. It just defines how your decline decreases after you deplete the reservoir. The DI represents initial decline. QI is the initial rate we should expect in these wells in this area. And then the QA is that abandonment rate.

I expressed it in that way because that's normally how we run our economics. But in essence, it's a different way to see that forecast.

CHAIRMAN BROOKS: And what was the B?

THE WITNESS: The B is the hyperbolic coefficient.

Q. (By Mr. Kellahin) If you'll turn the page to 13, we have a larger copy of the information on the decline curve plots for Area 1. Let's turn to that.

A. (Witness complies.)

Q. Describe again what you have done now with the actual production allocated to that particular well. And that's in the blue?

A. Yes. This is an enlarged view from the previous slide. Basically, we match -- history matched that actual performance and then use the parameters to forecast production going forward for the Mancos.

Q. And for each of the four areas you have a

similar slide as you put on page 13 which would then be 14, 15, and then 16?

A. Correct.

Q. Once you have taken your actual production, history matched it, and forecasted a projected decline, using certain assumptions, you now know the volume of gas that you could produce at that location?

A. Correct.

Q. You then apply certain economic cutoffs and determine whether it's economic to drill this?

A. Correct.

Q. Let's turn to the economic analysis. You'll find that on page 17.

A. (Witness complies.)

Q. First of all, before you describe it, tell us how this page is organized.

A. In the middle the plots represent the expected performance that we expect from the Mancos in those different areas.

These red lines is the average performance observed in all of those wells recently completed as tri-mingles in basically the Mancos.

What we did is, based on that performance, we run economics using some cost assumptions for

drilling and completing and gas price assumptions. In essence, underneath each plot you can see the NPV is negative. Basically, the net present value, if we were to drill those wells as a standalone using those assumptions, we'll be losing money.

The message here I'm trying to convey is that unless we commingle the Mancos with the Mesaverde and Dakota; and, therefore, split those billing costs, under this price environment Mancos research will be stranded.

If I could have your attention to the last line of those tables, that number represents the amount of reserve that we should expect from the Mancos to be recovered in those areas. And if we don't do -- if we don't commingle the Mancos with the Mesaverde and Dakota, that's the amount of reserve we believe will be stranded.

One -- go ahead.

CHIEF ENGINEER EZEANYIM: Yeah. Before you go -- you are using 10 NPV as your cutoff. 10 NPV is your cutoff. Anything below that is negative. Is that what you're saying?

THE WITNESS: I'm discounting my economics on 10 percent.

CHIEF ENGINEER EZEANYIM: Yes. Because

you told me that, you know, if you look at it, and they're all negative, you're not going to drill the well if you're going to be negative. What is your cutoff on the MCF?

THE WITNESS: I haven't run it on sensitivity. If I understand your question, you're asking what's the minimum gas price we need to support standalone development of the Mancos?

CHIEF ENGINEER EZEANYIM: Okay. Then tell me that, too.

THE WITNESS: I haven't run that sensitivity. That's something I can get back with you.

CHIEF ENGINEER EZEANYIM: Okay.

Go ahead.

A. Something to notice is that we haven't seen significant oil production from these wells. As you can see, the amount of reserve we're forecasting, based on actual performance in these four areas that are very spread throughout the basin.

Q. (By Mr. Kellahin) Going back to Mr. Ezeanyim's question, can we answer it by looking, for example, on page 15?

When we look at the left-hand side of one

of those displays, you're looking at MCFs per day. Are you cutting off your curve at 10 MCF per day? Is that how to read this?

A. That will be cut based on an assumed operating cost or economic limit.

Q. I understand that. But in terms of a number of gas volumes per day --

A. Yes.

Q. -- this is 10 MCF?

A. Yes. It's actually 5.

CHIEF ENGINEER EZEANYIM: Actually 5.

THE WITNESS: We are running our forecast to 5 MCF a day.

CHIEF ENGINEER EZEANYIM: Okay. When you go down to 17, I want you to explain your NPV calculations here. It's very important. Start with the left corner. You know, what are you trying to do? Because I want to understand what you're trying to do, you know, with your NPV calculations.

THE WITNESS: So basically what we're trying to see, what's the present value of drilling standalones. Positive means that when you incorporate the cash flows you are getting because of your production minus your capital, your investment in what you need to do, if it is

positive, it means that your cash flow from the production overstates your investment.

CHIEF ENGINEER EZEANYIM: I'm understanding, yes.

THE WITNESS: Okay. If the factor is negative, what that means is we're not making enough production or we are not having enough cash flow to pay for those investment costs of drilling standalone wells.

Does that answer your question?

CHIEF ENGINEER EZEANYIM: Not quite.

THE WITNESS: Okay.

CHIEF ENGINEER EZEANYIM: Go back. Now, you have a 10 percent rate of return, right?

THE WITNESS: We're discounting that at 10 percent. The NPV rule, if you're discounting at 10 percent, then your rate of return should be close to 10 percent.

CHIEF ENGINEER EZEANYIM: I'm trying to understand what you're trying to demonstrate with these calculations.

THE WITNESS: What I'm trying to demonstrate is that we have negative returns if we drill these wells as standalones. Your rate of -- basically, your rate of return will be negative.

We'll be losing money.

Is that clear?

CHIEF ENGINEER EZEANYIM: Well, is it indicated in these calculations? Is that --

THE WITNESS: The fact that we are discounting at 10 percent --

CHIEF ENGINEER EZEANYIM: Yes.

THE WITNESS: -- and still your net present value is negative, that tells you that your rate of return is way below that 10 percent.

CHIEF ENGINEER EZEANYIM: Let me ask the question a different way.

THE WITNESS: Sure.

CHIEF ENGINEER EZEANYIM: Okay. You drill a well, a gas well or a well, and then you have done a calculation using your net present value with the return of 10 percent. I want to see where you're, you know, getting the negative return on this calculation below here.

Maybe I -- what are you trying to demonstrate there? Okay. Now, let's read it. The gas price is $2/MCF.

THE WITNESS: Yes.

CHIEF ENGINEER EZEANYIM: You estimated, what, 2.5?

THE WITNESS: 2.5 percent.

CHIEF ENGINEER EZEANYIM: Okay. And then you drill the well with 1.25?

THE WITNESS: Yes.

CHIEF ENGINEER EZEANYIM: And then you --

THE WITNESS: By recovering --

CHIEF ENGINEER EZEANYIM: You recover at 29 MCF?

THE WITNESS: Yes.

CHIEF ENGINEER EZEANYIM: Okay. Then what does that say?

THE WITNESS: So what that says is --

CHIEF ENGINEER EZEANYIM: So you multiply 29 MCF by $2 and you are losing money.

I want you to show that negative. That's what I wanted you to show, that you are getting a negative return. Because if you multiply it, I think you're not going to get $1.2 million if you do that on that -- is that the estimated recovery, 251?

THE WITNESS: Yes. That is the reserve we expect to recover.

CHIEF ENGINEER EZEANYIM: You want me to do the calculation myself? You could have shown me this is negative by -- you know. But what you have done there is to show me that all you're getting is

negative, and I would see it immediately.

Why I'm asking questions, because I wanted to see if I do NPV calculations too, to demonstrate that I'm getting a negative; therefore, I would advise the company there's no way to go in there.

Now, what you're trying to let me know, you made me do the calculation myself, which is okay. I can do it.

THE WITNESS: Okay.

MR. KELLAHIN: Mr. Ezeanyim, we are happy to redo the calculation. There's no reason for you to do it for us. We're happy to do that.

CHAIRMAN BROOKS: You may continue.

MR. KELLAHIN: Thank you.

Q. (By Mr. Kellahin) So when we look at the set of exhibit displays for page 17, you have examples for the four areas?

A. Yes.

Q. And then when we turn past that, you're looking at these Mancos standalone economics?

A. Yes.

Q. You're again displaying the same information in a larger visual, so that we can see the details of that information?

A. Yes.

Q. And then that would be on 17, 18, and 19?
A. And 19, yes.
Q. Now, let's turn to page 20.
A. (Witness complies.)
Q. Down at the bottom you have a gray block that repeats a block we saw earlier, where you have a population of 144 applications that were filed and approved for tri-mingles, right?
A. Yes.
Q. Have you now organized this to show what ConocoPhillips has presented?
A. Yes.
Q. And show us how you have done that.
A. If you recall from my first exhibit, I displayed in red triangles the future wells that Conoco is expecting to drill in the next three years.

As I said, half of those have been already processed. And 27 out of those 60 wells have been already approved by the commission through C-107As here in Santa Fe.

Q. Have you received any rejections from those, any of those?
A. No, we haven't.
Q. When I look over on the left side of this

display there's a yellow and a green color code.

What -- is this the population of the total 27?

A. This is a snapshot of the population as of April. Keep in mind that as we keep getting these wells ready to drill, this amount of file wells keeps increasing.

The chart shows the wells we have filed. And I highlighted in green the ones that have been already approved by the commission here in Santa Fe.

Q. Okay. Now, let's turn to what you have done about tabulating the available data on pressures, Mr. Pertuso.

A. Sure.

Q. If you'll turn to what I have marked as page 21.

A. (Witness complies.)

Q. Before you describe the details, first of all, tell us what we're seeing.

A. What you're seeing is the amount of wells where we have data from the amount of pools where Mancos is already being commingled with Mesaverde and Dakota. And they're also looking at pools where we have pressure in the Mancos that show the Mancos is at or below hydrostatic pressure so it won't pose

any threat to the other formations if commingled.

Q. Are you satisfied, as a reservoir engineer, that you have a population of data points that are indicative of all the flavors of pressures you could derive from the entire Basin-Mancos pool?

A. I do. That, in conjunction to what Zack Swaney talked about, the continuity of the Mancos, makes me feel very comfortable that these points had a very good spread and they can be very well extrapolated to other areas that we don't have here.

Q. Mr. Pertuso, would you explain what it means as a reservoir engineer, in terms of commingling, if you have pressures either at or below the hydrostatic rating? What does that mean?

A. What that means is, in case of a long shutin you won't have any pressures that will exceed frack -- fracking gradient from the other formation that could jeopardize productivity.

Q. Do you find any evidence that would cause you to believe that the division should not grant you pre-approval for pressure issues with regards to commingling of Dakota, Mesaverde, and Mancos?

A. No.

Q. Let's turn now to page 22.

A. (Witness complies.)

Q. What is the topic here on page 22?
A. On 22 we're showing pressure gradient for all of those wells that are either being processed, approved, or are to be submitted to the division.
If you go to the third column of the table, to the right it shows that pressure gradient that we would expect in the Mancos in all of those locations.
Overall, they are at or below hydrostatic. We have some cases where we have slightly higher than hydrostatic, but it's still way below the .6 that the rule states.
Q. So when you take the whole table, over on the upper right-hand corner you say minimum, maximum, and average.
A. Yes.
Q. Is there a pressure gradient cap number that you are worried about, as a reservoir engineer, that says, "I now have a well that exceeds the number I'm worried about"?
A. As the rule states, .6 is the maximum allowable.
Q. So as we go down the population, or the inventory of these, what, 46 wells on the sheet?
A. Yes.

Q. Of the 46 wells, all of these are below the 0.6 number?

A. That's correct.

Q. In addition to all of that, do you have a grouping of seven wells for which you have even more specific pressure information?

A. Yes.

Q. Let's turn to page 23 now, Mr. Pertuso, and look at your data from a unique population of seven, and tell us how you use that to make general engineering conclusions.

A. Yeah. To get some background, what we have done is we have isolated the Mancos and measured actual pressure of the sand face.

What we have found is just confirming our estimates that the Mancos is at or below hydrostatic gradient. So these points confirm that the Mancos is not overpressured and then won't pose any threat if commingled with Mesaverde and Dakota.

Q. Okay. Let's start with the top one. It says the Rosa unit. Do you see that in the block?

A. Yeah.

Q. Start with the first well, Rosa unit 634A.

A. 634A.

Q. You found the location, the operator, and

tell us how to read the balance of the columns.

A. Sure. The measured pressure in the Mancos in this well is 2,300 pounds. By the rule, the Mancos could go all the way to 5- -- to 4,000 before posing a threat. That's assuming the .6 frack pressure gradient that the rule states. All of those pressures are way below the maximum pressure allowed by the rule.

Q. Have you found any instances in your research where the division has denied commingling because they have busted the pressure qualification rule?

A. Not to my knowledge.

Q. Let's turn to your final display. If you'll look at page 24.

A. (Witness complies.)

Q. Let's talk for a moment about this composition issue. When we look at gas composition, how does that fit into the regulator's decision about commingling?

A. We need to make sure that the BTUs -- or that the value of the production from each of the commingled pools won't dilute or won't lose value as a result of commingling if there is a big difference in BTU.

What I have in this exhibit is to show how the difference in BTU between the Mesaverde and the Dakota is greater than what you would expect between the Mancos and the Mesaverde and the Mancos and the Dakota. And the Mesaverde and the Dakota are already pre-approved pools for commingling.

Just to walk you through that chart, the first columns, those are comparing Mancos gas to Dakota gas. You can see the Dakota is a leaner gas, more methane concentration, and the Mancos is a richer gas, more heavy.

Now if you move to the lower part of that chart, when you compare the gas from the Mancos to the Mesaverde, the Mesaverde is actually richer than the Mancos. And that's what I was saying -- what I was referring to when saying that the difference in BTU between the Mesaverde and the Dakota is greater than what you should expect from the Mancos and the other three formations.

Q. Again, in your review of the approvals by the division, have you seen any difficulties with the compatibility of constituents in the values or the composition of fluids?

A. Not to my knowledge.

Q. You don't see any that you have found that

were rejected for this reason?

A. No.

Q. In conclusion then, Mr. Pertuso, do you believe that there is adequate reservoir engineering information upon which to adopt the pre-approval status for the Basin-Mancos gas pool for these various components that we have described in your testimony?

A. Yes. There's enough precedent to prove this pre-approval.

MR. KELLAHIN: Mr. Examiner, we move the introduction of Mr. Pertuso's exhibits behind Exhibit Tab 15. And they will be pages 10 through 24.

CHAIRMAN BROOKS: Okay. Exhibit 15, pages 10 through 24 are admitted.

MR. KELLAHIN: That concludes my examination, Mr. Pertuso.

CHAIRMAN BROOKS: Okay. Once again, I'll let Mr. Ezeanyim proceed with his examination.

CHIEF ENGINEER EZEANYIM: Okay. Let's assume for the moment that the fluids are compatible. Let's go back to 23.

THE WITNESS: Yes.

CHIEF ENGINEER EZEANYIM: What is the

difference between -- what is the difference between measured pressure and estimated pressure?

THE WITNESS: Sure. As we're taking data points to estimate pressures in new locations, based on the continuity -- geological continuity of the Mancos, we are able to interpolate those points far away from the actual pressure measure. We have measured pressure in those wells, and they have confirmed that our estimates are in agreement with the actual pressure.

CHIEF ENGINEER EZEANYIM: Okay. There is some variation. But then if you look at them, I don't know what the estimate -- I'm really interested in if the previous estimated pressure measure is right, because that's what we're looking at. You don't want that measuring criteria to cloud what we're doing here. That's really all I'm looking at.

THE WITNESS: Okay.

CHIEF ENGINEER EZEANYIM: So I want to understand why you estimated pressure. Why did you want to put estimated pressure? Is that to show that as close?

THE WITNESS: Yes. I am not showing our estimated pressure in this chart.

CHIEF ENGINEER EZEANYIM: Okay.

THE WITNESS: This chart only shows Mancos measured pressure. That's all it shows. It's to confirm that the Mancos is not overpressured.

CHIEF ENGINEER EZEANYIM: And then you're estimating it in the Dakota?

THE WITNESS: The Dakota, those are estimates, yes.

CHIEF ENGINEER EZEANYIM: Okay. Now, how do you get this maximum pressure allowed? Are you using .65?

THE WITNESS: Exactly. Basically we multiply the top perforations -- in this case most of those the Mesaverde -- times the .6. And that's how we come up with that, yes.

CHIEF ENGINEER EZEANYIM: And you compare the lowest zone that you are going to commingle, and then you think there will be no issue with the formation damage?

THE WITNESS: Yes. That's correct.

CHIEF ENGINEER EZEANYIM: Did you look at crush flow? Who should answer that question?

THE WITNESS: Yes. We -- we didn't see any crush flow issues. It is shown in pressures -- shown in times. If there is any crush flow at the

end, since we have fixed allocation, that gas is going to be recovered. And we don't have great pressure differences between those formations.

CHIEF ENGINEER EZEANYIM: Yes. And in doing your calculation, you assume most of them are hyperbolic, right?

THE WITNESS: Correct, sir. They just come up from low permeability.

CHIEF ENGINEER EZEANYIM: Did you ever try to calculate the mobility ratio?

THE WITNESS: I'm sorry. Say again?

CHIEF ENGINEER EZEANYIM: Did you calculate any mobility ratios? No?

THE WITNESS: No.

CHIEF ENGINEER EZEANYIM: Out of the seven applications -- or all of those applications you have sent to the Santa Fe office --

THE WITNESS: That's correct.

CHIEF ENGINEER EZEANYIM: -- 19 approved and 8 are pending?

THE WITNESS: Yes.

CHIEF ENGINEER EZEANYIM: Is pending with us right now?

THE WITNESS: Yes. And this is an ever growing number. It's just a snapshot we took. As

we keep developing these projects to be implementing, we keep submitting more applications.

CHIEF ENGINEER EZEANYIM: In those applications that were approved in the Santa Fe office, have you seen anything abnormal by commingling both or trying -- you know, doing the three commingles, Mancos, Dakota, and Mesaverde?

You've been operating for a long time. Did you see any problems?

THE WITNESS: We haven't. We haven't seen any problem that we haven't seen in our normal Mesaverde, Dakotas. We haven't seen anything exceptional on any new issue associated with including the Mancos.

CHIEF ENGINEER EZEANYIM: Okay. Let's go to the pool, to the three pools. I know you talked at length about it, the BTUs or whatever you have there.

THE WITNESS: Yes.

CHIEF ENGINEER EZEANYIM: The BTUs of the composite are compatible -- I mean the BTUs from these three zones, three pools. Are you telling me -- giving me an example of the BTUs of those -- gas in the Mancos, the Dakota, and the Mesaverde?

I didn't see any BTUs to say that these

are very compatible.

As you know, BTU is how we sell our gas, right?

THE WITNESS: Yes.

CHIEF ENGINEER EZEANYIM: Okay. I don't want to commingle 1,200 unit BTU with 700.

THE WITNESS: You're right.

CHIEF ENGINEER EZEANYIM: So what is the variability on these BTUs?

THE WITNESS: As I said, we have found more variability between the gases of the Mesaverde and the Dakota.

CHIEF ENGINEER EZEANYIM: Than even the Mancos. Is that what you're saying?

THE WITNESS: The Mancos is -- yes. There is less difference between Mancos and Mesaverde and Mancos and Dakota.

CHIEF ENGINEER EZEANYIM: And now you're saying, okay, because you are -- to commingle the Mesaverde and the Dakota, and this one is even better, is that what you're trying to say?

THE WITNESS: What I'm saying, if there is a BTU difference it will be more accentuated between the Mesaverde and Dakota, as far as diluting value of your products. The Mancos is in between those,

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is what we have found.

CHIEF ENGINEER EZEANYIM: You know, I asked you earlier if you had been before us. Don't be offended when we are asking questions. We are trying to explore whether I make a recommendation in this case. You know, if we understand what we're doing, we might make a good recommendation. So don't take it for anything. We are trying to come up with the truth.

THE WITNESS: Not at all. Keep them -- we're here to answer all your questions, make you feel comfortable to approve this.

CHIEF ENGINEER EZEANYIM: Right. I'm glad you understand that.

THE WITNESS: Yes.

CHIEF ENGINEER EZEANYIM: Okay. I'm sorry.

Mr. Brooks?

CHAIRMAN BROOKS: Okay. I wanted to go back to the question that I asked your geologist -- geological witness.

You were here, were you not, in the room when I made my lengthy speech on the -- what was involved in applying the rules in the R-12984?

THE WITNESS: Yes.

CHAIRMAN BROOKS: The bottom line question then is: Since -- in order to apply the order you propose for us to issue, which is an order that will allow commingling between wells that are classified as Basin-Mancos gas, and the wells -- and completed also in other zones, we have to first determine whether or not that well in the Mancos is a gas well or an oil well, if it is located within one of these Gallup pools or in the periphery of one of these Gallup pools.

So our basic question is: Does that create a problem for applying the order you're asking us to enter?

THE WITNESS: From my engineering perspective, you can have an oil formation commingle with gas. We'll allocate appropriately, and we have been doing that in those pools for a long time.

I don't see any performance issue if you're getting a lot of oil from the Mancos and then gas from the Mesaverde and Dakota.

Have you seen -- as you saw in my exhibits, we haven't seen a lot of oil production from the Mancos in these wells we have completed over the past six years.

CHAIRMAN BROOKS: Well, I would have to

take your word for that, in an engineering perspective. But I don't believe that that solves the issue of what you're asking for in this case and whether or not maybe we need to approach it from a somewhat different perspective.

Because given the way our existing order works, the first thing we have to do to determine whether we have a well that is in the Basin-Mancos gas pool, if it is within one of these zones, is to determine its gas/oil ratio.

And to do that I would assume that we have to isolate the Mancos and produce only the Mancos, so we can determine what the gas/oil ratio is from the Mancos.

THE WITNESS: Correct.

CHAIRMAN BROOKS: But that's not what you contemplate doing, correct?

THE WITNESS: Back to that statement, I have to say in some instances, due to the very low production of the Mancos, it can be even cost prohibitive to do so.

CHAIRMAN BROOKS: Yes. That does not surprise me.

THE WITNESS: Yes.

CHAIRMAN BROOKS: So then is there a --

are the production characteristics of the Mancos such that we're going to be able to tell, without doing that kind of testing, whether or not in the Mancos alone we are in a gas productive zone or an oil productive zone? Is there a practical way of doing it?

THE WITNESS: Our spinner logs -- spinner logs is a technology that would allow you to measure gas, oil, and water from every one of these formations.

CHAIRMAN BROOKS: So it would tell you separately the gas and the oil production from the Mancos within some period of time?

THE WITNESS: Yes.

CHAIRMAN BROOKS: Mr. Kellahin, in his opening remarks as I understood him, suggested that there are some -- and I believe this was consistent with the geologist's testimony -- that there are distinct zones within the Mancos within which you have a predominance of oil and predominance of gas.

THE WITNESS: Yes.

CHAIRMAN BROOKS: And so that is your understanding?

THE WITNESS: Yes.

CHAIRMAN BROOKS: And how do we know where

we are when we get a particular well?

THE WITNESS: Well, as Zack expressed, and I will -- correct me if I'm saying something that's not sound. The Tocito were the initial targets for the Mancos, where we have great permeability and oil. And this has been pretty much depleted. Our target now, we're going to the upper -- or to the El Vado A, B, and C, and we haven't seen a lot of oil coming out of those members of the Mancos.

Is that something you want to add?

CHAIRMAN BROOKS: Okay. The reason it's, I think much of a concern is because we have some designated associated pools in -- within this area. And if it is simply a regulatory anachronism, that is to say we had a reason for establishing these pools with this -- these gas/oil ratios at a time when that was done, which was a long time ago, then it's something that, really, we should ask you to supplement your application so we can correct that, possibly.

If, on the other hand, there is a reason from a conservation standpoint where we need to be exercising control over production based on gas/oil ratios, then we need to know that.

So that's, I guess, the question I'm

asking you. Is there any conservation reason why we need to be closely monitoring these gas/oil ratios for particular wells in the Mancos at this time?

THE WITNESS: From my perspective, as far as performance, it won't make a difference. We'll allocate, we'll give each formation its share of the production.

CHAIRMAN BROOKS: And you regard the results of the spinner test as being sufficiently accurate to enable us to regulate these wells based on the gas/oil ratios that it indicates?

THE WITNESS: Yes.

CHAIRMAN BROOKS: Please reply audibly for the court reporter.

THE WITNESS: Sorry.

CHAIRMAN BROOKS: Thank you. That's all I have.

Anything further, Mr. Ezeanyim?

CHIEF ENGINEER EZEANYIM: No.

CHAIRMAN BROOKS: Very good.

You may step down.

THE WITNESS: Thank you.

MR. KELLAHIN: A short statement if you please, Mr. Examiner.

CHAIRMAN BROOKS: Sure.

MR. KELLAHIN: At the end of which -- Mr. Catanach is here for another client. I've retained him as an expert consultant on behalf of ConocoPhillips for my own purposes, but he's here for another company to make a statement.

But in summary, then, we really have gone full circle with this, when you go back and read Steve Hayden's testimony.

I understand the dilemmas you have in reading the rule you wrote for the order. And Mr. Catanach and I have worked through that and have our opinion about how that was done and whether we need to revisit the process. We're happy to open an application, if necessary, to accomplish that purpose.

But my reading of Mr. Hayden's intent and purpose was to get away from the problem of oil wells in a gas pool. He also didn't want to subdivide the Mancos any further. His intent, appeared to me, is: Let's get all of the Mancos as a single gas pool, let's stop the expansion of these existing Gallup pools. He went to some care to gerrymanderer some isolated tracts in some of these pools to lock them together so they were linked as a regulatory matter. But I think he wanted to escape

the regulatory burden of creating new oil pools or new gas pools with subdivisions of the Mancos just as a regulatory convenience.

And in the real world, it's not going to matter. The commingling of this product is only going to be allowed because it's a salvage operation for getting what's left between the Mesaverde and the Dakota, and the Mancos needs to be treated as one single gas reservoir.

So the details of how you process your way through the subparts of the Rule 1B2, or whatever it is, I think Mr. Catanach -- subsequent to the hearing, we will give you how we think the rule works for us and how we are utilizing that rule.

If you find that in our explanation you want us to revisit that rule we'll file an application and we can come back to hearing.

CHAIRMAN BROOKS: Okay. I would appreciate your furnishing me that information.

I do believe -- I think you're right about what Mr. Hayden intended, and I think that I fairly much understood that.

I did not understand the geology of the area the way I do now. And I didn't, until this morning, understand -- I understand it much better

than I did before the beginning of this hearing, because your geologic witness made a very good presentation.

There have been some developments, as you are aware, of course, because several operators have become interested in developing the Mancos oil, which I don't think Mr. Hayden foresaw, at the time that we did this, that there would be a potential for Mancos oil development -- for further Mancos oil development. But --

MR. KELLAHIN: On a horizontal basis?

CHAIRMAN BROOKS: Yeah. To the extent that there is, anyway.

MR. KELLAHIN: Well, I think there's a way to deal with all of that.

CHAIRMAN BROOKS: Well, okay. I will await your post-hearing submission, then. And --

MR. KELLAHIN: We'll provide Mr. Ezeanyim with the additional calculation to clear up the confusion about how that was done.

CHIEF ENGINEER EZEANYIM: That was my initial reaction about this oil. Because like I said, I was excited when you came and told me they want to, you know, get oil from Mancos. Sure.

If it would have been gas it would have

been different. But now that we're trying to get some oil, I mean, it complicates the issue. I made that point at the beginning.

MR. KELLAHIN: I think there's a way to get through that.

CHAIRMAN BROOKS: Okay. Very good.

MR. KELLAHIN: David Catanach would like to make a statement.

MR. CATANACH: I'm David R. Catanach. I'm here on behalf of Enervest Operating, LLC, who is an operator of Mancos wells in the San Juan Basin.

Enervest would like me to convey to the division that they support the application of ConocoPhillips and request that the application be approved.

CHAIRMAN BROOKS: Thank you.

Anything further, Mr. Kellahin?

MR. KELLAHIN: No, sir.

CHAIRMAN BROOKS: Very good. Very well.

Case Number 14862 will be taken under advisement, and we will take a five-minute recess.

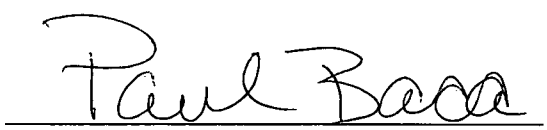
(Proceedings concluded.)

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 14862 heard by me on 6-25-12

David K. Brooks Examiner
Oil Conservation Division

CERTIFICATE

I, Paul Baca, RPR, CCR in and for the State of New Mexico, do hereby certify that the above and foregoing contains a true and correct record, produced to the best of my ability via machine shorthand and computer-aided transcription, of the proceedings had in this matter.



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