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

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

ORIGINAL

CASE 15430

APPLICATION OF CIMAREX ENERGY CO. OF COLORADO TO CHANGE THE SETBACK REQUIREMENTS IN THE WOLFCAMP FORMATION WITHIN TOWNSHIPS 24S, 25S, 26S AND RANGES 25E, 26E, and 27E, N.M.P.M., EDDY COUNTY, NEW MEXICO.

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

January 7, 2016

Santa Fe, New Mexico

BEFORE: PHILLIP GOETZE, CHIEF EXAMINER
GABRIEL WADE, LEGAL EXAMINER

This matter came on for hearing before the New Mexico Oil Conservation Division, Phillip Goetze, Chief Examiner, and Gabriel Wade, Legal Examiner, on January 7, 2016, at the New Mexico Energy, Minerals, and Natural Resources Department, Wendell Chino Building, 1220 South St. Francis Drive, Porter Hall, Room 102, Santa Fe, New Mexico.

REPORTED BY: ELLEN H. ALLANIC
NEW MEXICO CCR 100
CALIFORNIA CSR 8670
PAUL BACA COURT REPORTERS
500 Fourth Street, NW
Suite 105

A P P E A R A N C E S

For the Applicant:

EARL E. DeBRINE, Jr., ESQ.
Modrall, Sperling, Roehl, Harris & Sisk, P.A.
500 Fourth Street, NW
Bank of America Centre
Suite 1000
Albuquerque, New Mexico 87102
(505) 848-1800
edebrine@modrall.com

I N D E X

WITNESS WILLIAM SIRGO

E X H I B I T I N D E X

Exhibits Offered and Admitted

(Time noted 8:27 a.m.)

EXAMINER GOETZE: Next case, case number 15430, Application of Cimarex Energy Co. of Colorado to Change the Setback Requirements in the Wolfcamp Formation within Townships 24S, 25S, 26S, and Ranges 25E, 26E, and 27E, N.M.P.M., Eddy County, New Mexico.

Call for appearances.

MR. DeBRINE: Good morning, Mr. Examiner. Earl DeBrine with the Modrall Sperling firm in Albuquerque, New Mexico, for the Applicant, Cimarex Energy Co. of Colorado.

I will have three witnesses.

EXAMINER GOETZE: Will the witnesses please stand and identify yourself for the court reporter and be sworn in.

(WHEREUPON, the presenting witnesses were administered the oath.)

MR. DeBRINE: At this time, we would like to call our first witness, Jordan Cockrell.

EXAMINER GOETZE: Proceed.

MR. DeBRINE: Thank you.

JORDAN COCKRELL

having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. DeBRINE:

Q. Could you please introduce yourself and tell the examiner who you work for.

A. My name is Jordan Cockrell. I am a petroleum landman for Cimarex Energy in Midland, Texas.

Q. And Ms. Cockrell, what are your responsibilities as a landman for Cimarex?

A. I have been working for the Eddy County and the Delaware Basin for about a year and a half now. My responsibilities include deciphering if acreage that Cimarex finds respected to be open for lease -- if it is not open, then I try to figure out if the acreage is available to the trade or some type of agreement with the current owner.

I then work with my team to prepare the acreage to be ready to drill a well.

Q. Have you previously testified before the Division?

A. Yes, I have.

Q. Were your credentials as a landman accepted as a matter of record?

A. Yes.

Q. Are you familiar with the application, the lands and the pools that are the subject of Cimarex's

application here today?

A. Yes, I am.

MR. DeBRINE: We tender Ms. Cockrell as an expert in petroleum land matters.

EXAMINER GOETZE: She is so qualified.

Q. Ms. Cockrell, if you can turn to what has been marked as Exhibit 1 -- actually, let's start with Cimarex's application in this case. It is appended to Exhibit 5, the notice affidavit. And if you could just describe for the Examiner what Cimarex is seeking by its application.

A. Okay. What Cimarex is seeking in this application is to change the setback requirements for Wolfcamp pools near White City in Eddy County, New Mexico. This is somewhat complex, so I am going to read from our prehearing statement what Cimarex is looking to get from this hearing.

The reason that Cimarex applied for this -- for these changes is to modify the setback requirements in the current and proposed Wolfcamp pools included in Townships 24 South, 25 South and 26 South; Ranges 25 East, 26 East, and 27 East of Eddy County, New Mexico, to require wells to be located no closer than 330 feet to the outer boundary of a spacing unit.

We also included in the application at the

suggestion of the Division district geologist, Paul Kautz, Number 2: The expansion of the boundaries of the White City Wolfcamp Southwest Gas Pool 97766; White City Wolfcamp South Gas Pool 97592; Sage Draw Wolfcamp Gas Pool 84407; Sage Draw Wolfcamp East Gas Pool 96890; Black River Wolfcamp Pool 72240; Black River Wolfcamp East Gas Pool 97442; and the Sulfate Draw Wolfcamp Gas Pool 85780.

Number 3, The establishment of the Crooked Creek Wolfcamp Gas East Pool covering the north half of Section 5, Township 24 South, Range 25 East, Eddy County, New Mexico.

Number 4, The establishment of the Black River Wolfcamp Southwest Gas Pool covering the east half of Section 25 and the east half of Section 36, Township 24 South, Range 25 East, Eddy County, New Mexico, and the west half of Section 14, east half of Section 22, northwest quarter of Section 23; west half, northeast quarter of Section 27, the south half of Section 28, the south half of Section 29, and all of Section 30, and the south half and northwest quarter of Section 32 of Township 24 South, 26 East, Eddy County, New Mexico.

Number 5, the creation of the Welch Wolfcamp Pool Number 98017, covering Sections 26, 27, 28, 29, 32, 33, 34, and 35 of Township 26 South, 27 East, Eddy County,

New Mexico.

This is an entirely new pool and the pool name has been recommended by the district geologist.

(Continuing:) The creation of the Milepost Wolfcamp Gas Pool 97950, covering the west half of Section 29, Township 26 South, Range 25 East of Eddy County, New Mexico.

This is also an entirely new pool and the pool name has been recommended by the district geologist.

And, finally, Number 7: The creation of the Milepost Wolfcamp Northeast Pool, Number 97882, covering the east half of Section 16, Township 26 South, Range 26 East of Eddy County, New Mexico.

This is also an entirely new pool and the pool name has been recommended by the district geologist.

If you look to our Exhibit 5 -- and the application is included -- you will be able to see the specific lands that we would like to be included in these pools.

Q. Ms. Cockrell, you indicated you spoke to the district geologist, Paul Kautz, before filing the application, and he was the one who recommended the establishment of the pools that he had already designated and been using for wells that had been drilled in the area?

A. Yes.

Q. And he was also seeking the creation of new pools within the same area and he asked you to include that in your application?

A. That's correct.

Q. Are the specific lands involved in the application described in the application on Exhibit 5?

A. Yes, they are.

Q. And did Mr. Kautz have an opportunity to check and verify those lands?

A. Yes. He requested before we filed the application to review the application to be sure that everything was accurate. He did review it and didn't have any concerns.

Q. Let's turn to Exhibit 1. You generally described the location of where these pools are located in the White City area.

A. Yes. If you look at Exhibit Number 1, this is a locator map to show you the general area of the lands that are under this application. What you see here is a broad view of Eddy County, New Mexico, and the red square are the surrounding lands covered by this application.

Township 25 South, 26 East -- or Range 26 east is centrally located in this acreage. And it is located

about 30 miles south of Carlsbad.

Q. If you turn to Exhibit 2, could you tell the Examiner what is depicted on that map.

A. Exhibit Number 2 is zooming in from the previous map on that red box. This map was created by the Division district geologist, Paul Kautz. And what you are looking at is the Wolfcamp Gas pools near White City of Eddy County, New Mexico.

So we have color-coded each pool so you can easily differentiate between them. The solid colors here are existing gas pools. The crosshatched represents proposed expansions of those pools.

Q. Before filing your application, did you have any communications with any of the operators within the pool to determine whether they would support Cimarex's application?

A. Yes, we did.

Q. If you could turn to Exhibit 3.

A. Okay.

Q. Explain what that represents.

A. Exhibit Number 3 is the same pool map that I just showed you, but the difference is that we show here the Wolfcamp gas pools that are operated within each pool and within a one-mile boundary of each pool. To the right are all of the operators that operate these wells

that you see on this map.

Q. Did you receive letters of support back from the operators that are depicted in Exhibit 3?

A. Yes. If you turn to Exhibit 3-A, we received these letters of support from the operators listed on the map on Exhibit 3.

Q. And what is the percentage of the acreage within the pools and within a mile of the pool boundaries that's represented by the letters of support that you received?

A. We received letters of support from just over 95 percent of the operators. We did not receive letters from three of the operators who operate one well each -- which is less than five percent of the acreage. We did not receive a response. They did not oppose it. They just did not respond to my letter.

Q. Has the Division previously granted nonstandard locations for the drilling of wells within these pools on 330-foot setbacks in the past?

A. Yes, they have.

Q. Did you prepare a map to indicate the locations of the previously granted NSLs?

A. Yes. That is the -- this map is Exhibit 4. Again it is the same pool map that I have shown you previously. What I have included here -- I've

highlighted the Welch Wolfcamp Pool which I described to you in the prehearing statement that we are requesting to be established -- I'm sorry -- to be created.

The dark or the black solid lines are wells that Cimarex has drilled. The dashed lines are wells that Cimarex has permitted. And then the red dashed lines are wells that other operators have permitted.

The blue dots that you see here are approved NSL locations for both the permitted and drilled wells in this area.

Q. With regard to the notice of the operators within the pool and within a one-mile boundary, did you notify them of Cimarex's application before it was filed?

A. Yes. We did notify them and we received green cards showing us that they did receive the application -- or the notice of the application.

Q. And are those reflected in Exhibit 5, which is my office's affidavit of notice concerning the application?

A. Yes, they are. I'm sorry. I meant to mention we also published notice.

Q. And is that also requested in Exhibit 5, the publication?

A. Yes.

Q. Were Exhibits 1 through 5 prepared by you or

under your direction and supervision?

A. Yes, they were.

MR. DeBRINE: We would move the admission of Exhibits 1 through 5.

EXAMINER GOETZE: Exhibits 1 through 5 are so entered.

(CIMAREX ENERGY CO. OF COLORADO EXHIBITS 1 THROUGH 5 WERE OFFERED AND ADMITTED.)

MR. DeBRINE: And turn the witness over for questioning by the Examiner.

EXAMINER GOETZE: Counselor, do you have any questions?

EXAMINATION BY MR. WADE

MR. WADE: What was the purpose of publishing notice? Was there some unidentified interests or --

THE WITNESS: I think it was just to be very sure that we had notified everyone that needed to be -- but, no, we were sure about the people that were notified in the list of operators that we have.

MR. WADE: Okay.

MR. DeBRINE: And if you look at Exhibit 5, we got green cards back from everybody. We just wanted additional bells and whistles.

MR. WADE: Okay. That's fine.
EXAMINER GOETZE: Any more --
MR. WADE: No.
EXAMINER GOETZE: And just for clarity, you did meet with members of the Engineering Bureau on several occasions to discuss this?
MR. DeBRINE: Prior to filing the application, there were a couple of meetings explaining what we were trying to do, and then we got suggestions from them as to what we ought to have included in the application.
EXAMINER GOETZE: So the OCD has had participation in all phases of this?
MR. DeBRINE: Absolutely.
EXAMINER GOETZE: And I have no more questions for you.
THE WITNESS: Thank you.
EXAMINER GOETZE: I don't have any questions for you. Thank you very much.
THE WITNESS: Thank you.
MR. DeBRINE: At this time, we would like to call Meera Ramoutar.

MEERA RAMOUTAR

having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. DeBRINE:

Q. Would you please state your name and who you work for?

A. My name is Meera Ramoutar, and I work for Cimarex Energy.

Q. Ms. Ramoutar, could you give the Examiner a brief description of your educational and your work history.

A. I have a bachelor of science in geology. I also have a master's in geology from the University of Texas in Austin. And I have worked for Cimarex for just about seven years.

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

A. Yes, I have.

Q. Was your testimony as a geologist expert witness accepted -- I'm sorry. Were your credentials accepted as a matter of record in those proceedings?

A. Yes.

MR. DeBRINE: We would tender Ms. Ramoutar as an expert in petroleum geology.

EXAMINER GOETZE: She is so qualified.

Q. Are you familiar with the application and the pools that are the subject of Cimarex's application in

this case?

A. Yes, I am.

Q. And have you conducted a geologic study of the lands that are located within the pool and adjacent to the pools as part of your work in this case?

A. Yes, I have.

Q. Have you prepared some exhibits that are part of your geological study?

A. Yes, sir.

Q. Let's look through those. If you could turn to Exhibit 7 --

A. Okay.

Q. -- and describe for the Examiner what is represented in your Exhibit 7.

A. Okay. So Exhibit 7, the purpose of Exhibit 7 is, basically, to give you an idea of the different types of devolvement that can happen within gas reservoir. And so it is a block diagram, just a cartoon showing the different types of traps and the different types of reservoirs.

What I want to draw your attention to is the area of the block diagram labeled "conventional gas." And this basically just shows you that conventional gas reservoirs have historically been developed with vertical wells. The gas that is produced, you know,

it's from a gas cap and it comes to the reservoir through migration from the source rock.

Moving from the conventional gas trap to type gas -- I am going to the other side of the block diagram here. You can see these reservoirs are typically not as permeable and porous as are conventional reservoirs, and, hence, the word "tight." And so these are developed using horizontal wells.

The third one that I want you to look at is the shale gas wells. And that is primarily what we will be developing within these pools that we seek changes on today.

And those shale gas wells, we take it one step further. So we are actually going into that source rock. And that source bed is highlighted by that pink color. And you can see here that we are locating our well -- a wellbore within the source rock horizontally, and, you know, using fracture stimulation to be able to develop that.

Q. What experience does Cimarex have developing the Wolfcamp gas reservoir in this area?

A. We have been pursuing that reservoir for over two years.

Q. If you could turn to Exhibit 8 and explain what you're representing here.

A. I --

Q. I'm sorry. Exhibit 7.

A. So Exhibit 7, what I am trying to show here -- in the previous block diagram, we referred to conventional gas reservoirs or conventional reservoirs. And then we were trying to show the difference between developing of a conventional reservoir and an unconventional one.

What I have in front of you here are two sets of rock samples out of two different types of wells. The first one being from our 2nd Bone Spring wells, which are conventional reservoirs, and the second set of samples from our White City area out of the Wolfcamp itself.

And what we have here are different samples taken at different depths within these reservoirs, and the two main parameters that we try to look at, porosity and permeability, for each of these rock samples.

And the red box highlights the permeability for each of these. And what I want to draw your attention to is the simple fact that the permeability for the conventional sand reservoirs is the magnitude of difference as compared to the permeability that you see in the unconventional rock.

And so that ties back into that block diagram that shows you that these rocks are not very permeable,

and permeability just alluding to the ability of the pores to be connected and so alluding to flow.

These will not flow, and so we place our wellbore within that tight rock.

Q. Is that difference in permeability and porosity further represented in any other exhibits that you prepared?

A. Yes, sir. Exhibit 8 is tied directly to Exhibit 7. And so what I have done here is, there is an inflow graphic above in blue. And it just shows you how the conventional reservoirs relate to the shale gas reservoirs. And, like I said before, the permeability is the magnitude of difference.

And what I have done in the second part of that exhibit is I have a cross block of those points from Exhibit 7. And, again, it's just -- it's very visual, but showing you where the conventional sands plot with higher porosities and higher permeabilities as compared to the unconventional reservoirs like the Wolfcamp that is quite a bit tighter.

Q. Have you looked at well logs within the area as part of your geological study?

A. Yes, sir. My primary tool of analysis is well logs. And so in this area I have looked at over 450 logs just to try to kind of get an idea of how the

reservoir looks.

And what you have in Exhibit 9 is a type log from that area showing you the Wolfcamp zone of interest.

And so you can see, we have identified the gross interval of the Wolfcamp for about 1,400 feet of gross interval.

On the well log what we are looking at are -- the first, from left to right, it's our gamma ray track. And so that is -- we have colored it -- it's differently colored, but what I want to draw your attention to is the increase in the brown as you move from the top of the log down to the bottom.

And the brown color really is used as a proxy for lithology. And so the brown is basically our shales or mud stones. So you can see here the percentage of mud stone increases significantly as you move to the bottom of the section.

And then moving next door to that, we've got our porosity tracks; we've got our neutron and density porosity, identified by red and blue curves respectively; and then our resistivity; and, then, finally, our water saturation.

And one thing that we like to look at is -- this is a calculated number, but we do like to produce reservoirs that have lower water. It's a lot more

economic.

Drawing attention to two other things on the well log here. We have our Wolfcamp shale net pay highlighted in our depth track in that light blue color. And so Cimarex uses an internal cutoff of ten percent density as being rock density porosity, as being rock that is reservoir quality.

And you can see here that the primary reservoir is located in the bottom of the interval yet again.

And also we looked at cored -- we looked at rock samples earlier. And those rock samples were taken from a different well but the same stratigraphic interval that is identified by the gray box.

So just letting you know that our focus is that lower Wolfcamp zone. And we've taken all of our data supporting our case from that interval.

Q. And is the data reflected on Exhibit 9 representative of the other wells within the area of study?

A. Yes, sir.

Q. If you could turn to Exhibit 10 now.

A. So like I mentioned previously, I've looked at over 450 logs in this area, try to do a reservoir study from the geology side.

And based on that study of those well logs, this

is the product of it. Basically, this is the map that you have seen earlier from Jordan that has the pools that we are seeking to amend today on it, but in the background of that I have superimposed the net pay isopach that Cimarex uses. And so everything that is over 200 feet is shaded in this green color.

Also on the map I have the operators that operate wells that are productive out of these intervals. And just for simplicity, these are the only wells that I have -- these are I think 55 wells that are superimposed on this map. But, like I mentioned before, there is significant well control in this area.

Q. Were Exhibit 6 through 9 prepared by you or compiled under your direction and supervision?

A. Yes, sir.

Q. Ms. Ramoutar, do you have an opinion as to whether the entry of an order by the Division reducing the setback requirements for these pools from 660 feet to 330 feet will prevent waste and protect correlative rights?

A. Yes.

Q. What is that opinion?

A. I think that it will prevent waste.

Q. Will it also protect correlative rights?

A. It will.

Q. Do you have an opinion of whether reducing the setback requirements would adversely affect or impair the correlative rights of offset owners of the wells that would be drilled within these pools?

A. I do have an opinion, and I don't think that it will affect them adversely.

Q. Do you have an opinion as to whether the granting of Cimarex's application is in the interest of conservation?

A. Yes. It is in the interest of conservation.

MR. DeBRINE: That concludes my presentation.

EXAMINER GOETZE: You don't want to enter any exhibits?

MR. DeBRINE: I would like to move the admission of Exhibits 6 through 9.

EXAMINER GOETZE: Not 10?

MR. DeBRINE: Yes, and 10.

EXAMINER GOETZE: Yes, it's a nice isopach. Exhibits 6 through 10 are so entered into the record.

(CIMAREX ENERGY CO. OF COLORADO EXHIBITS 6 THROUGH 10 WERE OFFERED AND ADMITTED.)

EXAMINER GOETZE: Do you have any questions?

MR. WADE: No questions.

EXAMINATION BY EXAMINER GOETZE

EXAMINER GOETZE: On your preparation of your isopach, did you use this 10 percent cutoff --

THE WITNESS: Yes, sir.

EXAMINER GOETZE: -- as your means of compiling?

THE WITNESS: Yes, sir.

EXAMINER GOETZE: And do you have any feelings as to how far -- let me back up.

At this point how many wells, roughly, does Cimarex have completed in the Wolfcamp in this area which you've used for compiling information?

THE WITNESS: I believe that we have over 30 wells that we have drilled in the Wolfcamp. And my engineer will give you a better idea of that.

EXAMINER GOETZE: Very good. Great.

At this point we are primarily interested in that tight shale at the bottom of the formation. The upper portion of the formation you had no interest in or --

THE WITNESS: Not that we don't have any interest. But, at this time, the lower zone seems to be the more economically viable zone to go after.

EXAMINER GOETZE: Okay. In your discussion with Paul, we're taking the entire formation as a single

unit, is your understanding?

THE WITNESS: Yes.

EXAMINER GOETZE: We are not subdividing it or segregating it vertically?

THE WITNESS: I don't believe so, no.

EXAMINER GOETZE: Thank you. I don't have further questions.

Your next witness.

MR. DeBRINE: William Sirgo.

WILLIAM SIRGO

having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. DeBRINE:

Q. Mr. Sirgo, could you please state your name and tell the Examiner who you work for.

A. Will Sirgo, reservoir engineer for Cimarex Energy.

Q. How long have you been a reservoir engineer?

A. I have been a reservoir engineer for over six years; two years with Chevron in the Gulf of Mexico, and over four years with Cimarex in the Permian Basin.

Q. Could you provide the Examiner with just a brief summary of your educational background?

A. Yes. I grew up in Midland, Texas, went to high

school there, worked in the oil fields, and then proceeded to the University of Texas where I got a bachelor of science in petroleum engineering in 2009.

Q. Do you have a membership in any professional associations?

A. Society of Petroleum Engineers.

Q. Have you made an engineering study of the Wolfcamp Reservoir in the pools that are the subject of the application and the area surrounding the pools?

A. Yes, I have.

Q. Are you familiar with the application that has been filed by Cimarex in this case and the pools and lands that are the subject of the application?

A. Yes, I am.

Q. Have you previously testified before the Division?

A. No, I have not.

MR. DeBRINE: We would tender Mr. Sirgo as an expert in petroleum engineering matters.

EXAMINER GOETZE: He is so qualified.

Q. Mr. Sirgo, have you undertaken a petroleum engineering study of the area that's the subject of Cimarex's application in this case?

A. Yes, I have.

Q. If you could turn to what has been marked as

Exhibit 11. Is that an exhibit that you prepared as part of your study?

A. Yes, it is.

Q. And what are we looking at here?

A. So what I have done here is I have taken the pool map that's been provided to you all in previous exhibits. And what I have annotated in the yellow circles, those are Cimarex operated Wolfcamp wells.

So your earlier question of how many wells we have in an area, this is -- these are our wells that we operate. And then what I've annotated on top of those is two wells that I'm going to talk in deeper detail about.

The well furthest to the east is Cottonwood Draw 22 Fed No. 1. This is a well Cimarex drilled some time ago. And we took a full PVT analysis on this well to understand our reservoir fluids.

And then the well further to the west is our Hayduke 34 Fed No. 3H. This is the most recent well Cimarex has drilled in the area, has our most stimulation on it, and I'm going to show you an oil analysis related to that well.

Q. And you are talking about the area -- you're talking about the area in Exhibit 1, the locator map, that's the area north of the Texas border; is that

right?

A. Correct.

Q. Is it true that Cimarex also operates Wolfcamp wells in the same reservoir in Texas south of the border?

A. Yes. The four townships directly south of the state line, Cimarex has a 100,000 acre project area. We operate Wolfcamp...

Q. If you could turn to Exhibit 12, please, and take us through that and explain what's represented there?

A. So this is just a snip from the PVT analysis done on the Cottonwood Draw 22. A PVT analysis is something we do very early on when we're developing reservoirs to better understand the reservoir fluid.

I point your attention to the first yellow box on the right side that is labeled "Result Summary." If you go down to the third bullet point, you can see that the analysis showed it is retrograde gas in the reservoir. And beyond the full PVT analysis, we also look at the API gravity.

If you look at the second yellow box on the right, where it shows API gravity of this oil, it's 54 degrees, which we would consider matches the analysis of retrograde condensate in the reservoir.

Q. And as you indicated earlier, this PVT analysis

was for a well that was drilled a little bit earlier in time?

A. Yes. This is one of our earlier wells. I believe this well was drilled in 2010.

Q. And if you could turn to Exhibit 13 --

A. So --

Q. -- is that the analysis for the latest well?

A. Yes. So this is an oil analysis for the latest well. So our PVT is very nice to have. We do not have ample amounts of PVT to study other wells, but we do have oil analysis on all our wells.

So if you look at our most recent one and you go to the oil analysis on the right, what I have circled, its API gravity is also 57 degrees. So what that shows is Cimarex is -- even in many, many years of stimulation evolution, our fluid is the same.

Q. If you could turn to Exhibit 14. Could you explain what you've depicted there?

A. So this is the same map I showed you in Exhibit 11. All I've done now is went ahead and showed you all the gravities of all our wells in the area. And you can see across -- everywhere we drilled an area, they've got gravity ranges from 54 degrees to 58. So we would consider the reservoir fluid across this entire area the same.

Q. Let's turn to Exhibit 15, Mr. Sirgo?

A. Okay.

Q. And what are you trying to represent here?

A. So what I am trying to represent here is that, as Meera set up earlier, in dealing with unconventional reservoirs, your drainage profile isn't so much dictated as you would usually see in a conventional, a radial drainage. It's more dictated by the stress orientation of your formation.

And so what I want to walk you all through here is a quick cartoon on how we figure out the way we think that profile will manifest itself as we stimulate the well.

The red box on the right -- on the left is supposed to exhibit just a piece of formation that we would be stimulating against. The blue arrows would mark the three different forces acting on that piece of formation; your vertical stress coming from above you, all your overburden.

And then on a horizontal level, two stresses. And out of those two stresses one is going to be lower than the other. And that will be the stress that the stimulation pushes back on.

So if you move to the cartoon on the right side of the exhibit, what I've illustrated is how a frac

would open if this was your stress direction. And then what I've annotated with the little blue arrow coming off that box is the direction it would grow.

Q. Is the direction of fracture depicted on Exhibit 15 consistent with the results that you've experienced in drilling in the area?

A. Yes, it is.

Q. Let's turn to Exhibit 16. And if you could explain what's represented there.

A. So this is just further explanation coming off Exhibit 15. This is a bird's eye view, so now we are looking down at a horizontal wellbore, which is indicated by the green line.

And then what I -- the red ellipses are supposed to indicate different fractures. And then the blue arrows again are our stress regime for the formation.

And as you can see, those fractures are all going to push against that minimum stress, and that's the way they're going to open.

And so what this will show you is that no matter how that green line was drilled, those fractures will open in that direction. And it's just again showing that when dealing with unconventionals, your drainage profile is much more different than you are used to in a conventional.

Q. Let's take a look at Exhibit 17, Mr. Sirgo.

A. Exhibit 17, so all I'm going to do here is prove to you all that the reservoirs that we're talking about in White City directly relate to the reservoirs we drill in Culberson County, Texas.

So what I've done on the left side of the exhibit is shown the map we've been looking at. And then I've added in our project area from Texas to the south, indicated by the red box.

All the yellow circles would be Cimarex operated Wolfcamp wells.

And then what I have annotated with the yellow stars is PVT data we've taken across this area. So you have two in White City and you have four in Culberson.

And what I've done on the right is shown that every single PVT analysis resulted in the same reservoir fluid.

The reason I've circled the Cottonwood Draw -- we talked about it earlier -- but that is also a full PVT analysis that Cimarex has provided to the NMOCD for review. And they agreed with us that indeed it was retrograde.

Q. And approximately how many wells have you drilled in the Culberson project area in the Wolfcamp?

A. Well over fifty.

Q. And what's the setback requirements with respect to the wells that have been drilled south of the border in Texas?

A. They are much closer than our setbacks in New Mexico. It's 200 feet.

Q. If you could turn to Exhibit 18, and explain what you are representing there.

A. The reason for the earlier exhibit was just to show that that area relates to the area you're talking about, because I am going to take some stress data out of that area and relate it back up to White City.

So what we have here is an exhibit of our Culberson block, all the operated Cimarex acreage is marked in yellow. And then the little circles are Rose diagrams that basically are induced fracture plots -- drilling-induced fracture plots.

And what I have annotated with the green arrows -- these Rose diagrams show us where that maximum stress is, which, in turn, will help us predict how our fractures will grow.

And so what I want you to pay attention to is the top two diagrams. Those are right up against the state line, so they directly relate to what we'll be developing in White City.

And you can see they have a 45-degree northeast

to southwest orientation.

Q. If you turn to Exhibit 19, Mr. Sirgo.

A. Yes.

Q. What are you trying to represent in this exhibit?

A. So what I am trying to represent here is because of the geometry of your drainage profile in an unconventional reservoir, just because you're 660 feet away from the lease line, that does not mean your fracture will get there in 660 feet.

So what I have annotated here is two different cartoons. The left cartoon with the larger triangle would be a well drilled on the 660 setback. The right cartoon would be a well drilled on a 330 setback. And I have shown where the wellbore toe is.

And so on the orientation we will see in White City, for us to reach the lease line of a 660 setback, that requires a 930 feet frac half length. And on a 330 setback, that would be 467.

And due to the low permeability of this reservoir combined with our experience drilling the Wolfcamp, 933 feet is a very unrealistic half length for this play.

Q. And when you say "unrealistic," why is that?

A. Just based on -- you know, I will go back to the permeability profiles that Meera was talking about. The

Bone Spring Sands was somewhere that we see frac lengths of this length, and the perm magnitude is so much better than what we're dealing with here. So for me to expect the same half length is just unrealistic.

Q. Have you made an estimate of what waste would be associated with utilizing 660-foot versus 330-foot setbacks?

A. Yes. If you proceed to Exhibit 20. And this is a little busy cartoon, so let me walk you through it. What this is supposed to represent is a single section, 640 acres.

What I have annotated in the black-hashed box within the big box is 660 setbacks around the entire section. Every green line is a wellbore.

And then the red ellipses are again what we expect our fracs to extend to and what they will touch.

And what I've highlighted in yellow is the potential waste we see from being so far away from the lease line.

And then the other piece of the cartoon would be up in the north top right corner. Again I have annotated how big a frac length you would need to get to your lease line.

Q. Have you also undertaken a study of what additional reserves would be recovered through 330-foot

setbacks?

A. Yes.

Q. If you could turn to Exhibit 21.

A. So if you were allowed to get to 330s, this would allow you to access that 150 acres that was not being accessed previously on 660.

And so what this allows you to do is you had, basically, 490 acres you could access before, and now you can access a full 640. That's a 30 percent increase in section recovery.

What it also allows you to do, it allows us to drill an additional well. And so now we have eight wells draining 640 acres, which would be an 80-acre drainage; to before we had seven draining, 490. So you've also increased your recovery per well, which will benefit your well economics of course.

Q. Do you have an opinion as to whether the granting of Cimarex's application is in the interest of conservation and will prevent waste and protect correlative rights?

A. I believe it will prevent waste, it will protect correlative rights, and is in the interest of conservation.

MR. DeBRINE: I have no further questions. And I move the admission of Exhibits 11 through 21 --

excuse me --

Q. (By Mr. DeBrine) Were these exhibits prepared by you or under your direction and supervision?

A. Yes, they were.

EXAMINER GOETZE: And we will go ahead and enter Exhibits 11 through 21.

(CIMAREX ENERGY CO. OF COLORADO EXHIBITS 11 THROUGH 21 WERE OFFERED AND ADMITTED.)

EXAMINER GOETZE: Do you have questions?

MR. WADE: I have no questions.

EXAMINATION BY EXAMINER GOETZE

EXAMINER GOETZE: First of all, I am going to request some additional information.

THE WITNESS: Okay.

EXAMINER GOETZE: Let's get out your pens and pencils. Let's go back to your -- let's see. Exhibit 17, we show here -- we've got three PVTs in the New Mexico side and the dark star, is that the one that's close to the Texas border?

THE WITNESS: So these are -- on the right, the list is in order from north to south.

EXAMINER GOETZE: Okay.

THE WITNESS: So the Seldom Seen, the Cottonwood Draw, in New Mexico; the Owl Draw is in

Texas, but it's right up against the state line.

EXAMINER GOETZE: Okay. That's fine. What I would like you to do is provide us with the PVT results for each of these.

THE WITNESS: Okay.

EXAMINER GOETZE: And include initial reservoir temperature and pressure, a dew point, critical temp, and whether this single phase state of the reservoir at initial temperature, whether it was a gas or an oil.

This will be supplemental information. And this will be reviewed by our engineer, so we would like to have this instead of wandering around without the information.

I don't feel it is necessary to continue the case since it is unopposed. So if you will make that information available to the best of your timely fashion.

THE WITNESS: Absolutely.

MR. DeBRINE: We can do that.

EXAMINER GOETZE: On that note, the question with regards to, how far do your fractures reach? We notice that the picture is very nice and it does make it up right to that lease boundary. What information do you have to support your fracture lengths or at

least your drainage will stay within your own rights?

THE WITNESS: Mainly empirical evidence. We've done ample drilling in the Wolfcamp and a lot of other low permeable shales within New Mexico.

Our team specifically is very active in the Avalon. So in these low perm reservoirs, their frac lengths are all 467 or under.

All of our peers are developing Wolfcamp on eight wells per section spacing, so we would assume that they are agreeing with us that they are seeing similar frac lengths, and, then, also the fact that they didn't oppose our setbacks. We think that they agree with --

EXAMINER GOETZE: Just because we don't all agree doesn't necessarily mean we're doing the right thing. Do we have any micro-seismic --

THE WITNESS: I would have to review the White City area because we haven't gone into full development.

EXAMINER GOETZE: If you could possibly go through your records and see if you have any micro-seismic to support fracture patterns, we would like to see that also.

THE WITNESS: I know we have some in other areas in our --

EXAMINER GOETZE: In Wolfcamp?

THE WITNESS: Let me double-check. I want to make sure --

EXAMINER GOETZE: Preferably, Wolfcamp; Avalon is kind of stretching it, because we're talking about something a little bit different.

THE WITNESS: Yes, I agree. Okay.

EXAMINER GOETZE: So we have a little more homework to do on this.

And just for clarity, Exhibit 12, we've got reservoir conditions. Those are initial reservoir conditions?

THE WITNESS: Correct.

EXAMINER GOETZE: Okay. At this point, I have no further questions.

Let's go ahead and provide that information in the best format. Raw data if you do have it possibly available. We don't want anything that you feel is proprietary.

THE WITNESS: Okay.

EXAMINER GOETZE: If it is proprietary, do tell us in advance. Provide that to the Clerk, Florene Davidson through your Counsel.

THE WITNESS: Okay.

EXAMINER GOETZE: At this point, I have no

further questions of this witness. Case 15430 is taken under advisement.

Let's take a 15-minute break at this point and re-adjourn back here at 9:30 please.

MR. DeBRINE: One other thing --

EXAMINER GOETZE: What do you got?

MR. DeBRINE: Just for ease of reference, we'll provide to Division Counsel a copy of all the pool orders that are the subject of the application so it is easy to reference.

EXAMINER GOETZE: You don't want us to be confused about our own orders?

MR. DeBRINE: It's just a lot easier to have --

EXAMINER GOETZE: I'm sure it is a lot easier. We'd appreciate that if you could go ahead and compile those pool orders. And we will also be talking with Paul Kautz to make sure at the last minute we have every name right and every pool --

MR. WADE: And, actually, if you could send it to Mr. Goetze as well.

MR. DeBRINE: Okay. We will do that.

EXAMINER GOETZE: We continue on. Let's take that 15-minute break. At 9:25 we'll be back here.

MR. DeBRINE: Thank you.

EXAMINER GOETZE: Thank you.

(Brief recess.)

(Time noted 9:11 a.m.)

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 15430 heard by me on January 7 2016.

Phillip R. Goetze, Examiner
Oil Conservation Division

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

REPORTER'S CERTIFICATE

I, ELLEN H. ALLANIC, New Mexico Reporter CCR No. 100, DO HEREBY CERTIFY that on Thursday, January 7, 2016, the proceedings in the above-captioned matter were taken before me, that I did report in stenographic shorthand the proceedings set forth herein, and the foregoing pages are a true and correct transcription to the best of my ability and control.

I FURTHER CERTIFY that I am neither employed by nor related to nor contracted with (unless excepted by the rules) any of the parties or attorneys in this case, and that I have no interest whatsoever in the final disposition of this case in any court.

Ellen allanic

ELLEN H. ALLANIC, CSR
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