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:

CASE 15343

APPLICATION OF LRE OPERATING, LLC, FOR APPROVAL OF A PILOT WATER FLOOD PROJECT, EDDY COUNTY, NEW MEXICO.

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

August 6, 2015

Santa Fe, New Mexico

BEFORE: MICHAEL McMILLAN, CHIEF EXAMINER
GABRIEL WADE, LEGAL EXAMINER

This matter came on for hearing before the New Mexico Oil Conservation Division, Michael McMillan, Chief Examiner, and Gabriel Wade, Legal Examiner, on August 6, 2015, 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.

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I N D E X

I N D E X (cont'd)

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

Exhibits Offered and Admitted
LRE OPERATING LLC

(Time noted 8:17 a.m.)

EXAMINER McMILLAN: We might as well just go ahead and get started. The first case I will call will be application of LRE Operating, LLC, for approval of a pilot water flood project, Eddy County, New Mexico.

Call for appearances.

MR. LARSON: Good morning, Mr. Examiner, Gary Larson of the Santa Fe Office of Hinkle Shanor for the applicant, LRE Operating. I have two witnesses.

EXAMINER McMILLAN: If the witnesses would please --

MR. FELDEWERT: If it would please the Examiner, Michael Feldewert with the Santa Fe Office of Holland and Hart, appearing on behalf of COG Operating, LLC.

I do not have any witness here today.

EXAMINER McMILLAN: The witnesses at this time would please stand up and be sworn in.

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

MR. LARSON: May I proceed?

EXAMINER McMILLAN: Yes, please.

BOBBY RAY REYNOLDS

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

DIRECT EXAMINATION

BY MR. LARSON:

Q. Good morning, Mr. Reynolds. Would you state your full name for the record.

A. My full name is Bobby Ray Reynolds.

Q. And where do you reside?

A. Houston, Texas.

Q. By whom are you employed and in what capacity?

A. I am an employee of Lime Rock Resources as a landman.

Q. And what is the relationship between Lime Rock Resources and LRE Operating, which is the applicant in this case?

A. They are affiliate companies.

Q. Have you previously testified at a commission hearing?

A. No, sir.

Q. Could you briefly summarize your educational background and your professional experience in the oil and gas business?

A. After attending the University of Texas, I have been employed, either directly or on a contract basis, by various oil and gas companies for the last 37 years.

Q. Are you a certified professional landman?

A. I am.

Q. And are you familiar with the land matters that pertain to LRE's application?

A. Yes.

MR. LARSON: Mr. Examiner, I move for Mr. Reynold's qualification as an expert in petroleum land matters.

EXAMINER McMILLAN: Any objection?

MR. FELDEWERT: No objection.

EXAMINER McMILLAN: So qualified.

Q. Who provided notice of LRE's application in today's hearing?

A. Permits West in Santa Fe.

Q. Did Permits West also prepare the C-108s for the three wells that LRE proposes to convert to injection?

A. Yes, they did.

Q. Did Permits West perform its work under your direction and supervision?

A. Yes.

Q. And I ask you to identify the document marked as LRE Exhibit No. 1.

A. It's a list of affected persons, sample notice letters, and UPS green cards.

Q. U.S.P.S.?

A. Yes, U.S.P.S. Sorry about that.

Q. And are the documents that comprise Exhibit 1

true and correct copies of the documents you've identified?

A. Yes, they are.

Q. And does the list in Exhibit No. 1 include all affected persons within a half-mile radius of each of the three proposed injection wells?

A. Yes.

Q. And are the owners of interest below the proposed injection well included?

A. Yes.

Q. And did all the parties listed in Exhibit 1 receive the notice letter?

A. They did, yes.

Q. And are you familiar with Lime Rock Resources A LP's application for cooperative water flood in Division case 14563?

A. Yes.

Q. And is LRE the successor to Lime Rock Resources A LP?

A. It is.

Q. And what was the scope of the proposed cooperative water flood in that case?

A. They were trying to do ten initial injection wells and it involved five state leases.

Q. And could you identify the document marked as LRE

Exhibit 2?

A. It is Division order R-13458.

Q. Is Exhibit 2 a true and correct copy of the order that appears in the Division's records?

A. Yes.

Q. And was Lime Rock's application denied in that case without prejudice --

A. Yes.

Q. Please wait until I finish.

A. I'm sorry.

Q. -- to Lime Rock presenting another water flood proposal to the Division at a later date?

A. Yes.

Q. And in the order did the Division suggest that Lime Rock perform a unit for purposes of cooperative water flood?

A. Yes.

Q. And what is the scope of the pilot water flood project that LRE now proposes?

A. The conversion of three wells, the Northwest State No. 1, 3, and 7 for injection.

Q. And what is the proposed injection interval?

A. The proposed interval is 2,400 feet to 3,300 feet in the San Andres zone of the Artesia, Grayburg, San Andres Pool.

Q. Could you identify the document marked as Exhibit 3?

A. This is an area land plat that I prepared.

Q. And did you prepare this plat?

A. I did, yes.

Q. And is the proposed water flood pilot project confined to the southwest quarter in the northeast quarter of section 32?

A. Yes.

Q. And does LRE currently have a water flood in this area?

A. Yes. There's a water flood in the northwest Artesia unit between 1,080 and 2,100 feet, which is the Premier Sand.

Q. And is the northwest Artesia Unit water flood separate and distinct --

A. Yes.

Q. -- from the pilot that is now proposed by LRE?

A. Yes, it is.

Q. And who owns the surface in southwest quarter of the northeast quarter of section 32?

A. COG.

Q. And who owns the minerals?

A. The state of New Mexico.

Q. And how many state leases are involved in the

pilot water flood?

A. One.

Q. And has LRE communicated with the state land office regarding the proposed pilot project?

A. We have. We had a meeting with them, an attendance for the state land office, Terry Worrell, Anchor Holm, and Pete Martinez.

Q. Was Will Jones of the OCD office at that meeting?

A. Yes, he was.

Q. And what feedback did you receive from the state land office?

A. The state land office had no problem with the proposed pilot program.

Q. And what is the extent of LRE's working interest in the area of the proposed pilot program?

A. LRE owns 100 percent working interest.

Q. And how did LRE acquire those interests?

A. This developed originally, SDX received farmouts from several parties. All the farmouts were pretty much identical, wherein they earned from a specified depth, which was normally 500 feet below the top of the sand down to 100 feet below the depth -- the total depth drilled.

SDX drilled a well in each 40 to earn 40 by 40, so the depths earned in each 40 vary across the project

area. SDX then conveyed this interest to Lime Rock Resources A LP, and Lime Rock Resources A LP then conveyed to LRE Operating LLC.

Q. And directing your attention to Exhibit 3, have you identified the depths of LRE's interest in each 40-acre spacing unit within the project area?

A. Yes, I have.

Q. And what are the depths of LRE's working interest in the southwest quarter?

A. They are all on the exhibit. However, I'll go through them. In the southwest quarter, the northeast of southwest, LRE owns 2,100 feet to 3,290 feet.

In the southwest, southeast of southwest, the ownership is 2,100 to 3,410. In the southwest, southwest, 2,100 feet to 3,220. And in the northwest, southwest, 2,100 feet to 3,304.

Q. And how about the northeast quarter of section 32?

A. The northeast quarter, starting with the northeast, northeast, LRE owns 2,100 feet to 3,297. In the southeast, northeast 2,100 feet to 2,950. In the southwest, northeast, 2,100 feet to 3,305 feet. And, finally, in the northwest, northeast, 2,100 to 2,950 feet.

Q. And does LRE have a plan in the event that the

Division approves its application and the pilot project demonstrates that secondary recovery will be economically feasible in this area?

A. The pilot project is a precursor to unitization.

Q. And during your meeting with the state land office representatives, did you discuss potential unitization?

A. Yes.

Q. Was that something the state land office was in favor of?

A. The state land office was in favor of unitization as it would maximize their revenue for the state land office beneficiaries.

Q. And in your opinion will the granting of LRE's application provide LRE with an opportunity to determine whether it will be economically feasible to recover oil that would not otherwise be recoverable?

A. Yes.

Q. And in your opinion, will the granting of the application serve the interest of preventing waste?

A. Yes.

MR. LARSON: Mr. Examiner, I move the admission of LRE Exhibits 1, 2, and 3.

EXAMINER McMILLAN: Objections?

MR. FELDEWERT: No objection.

EXAMINER McMILLAN: Exhibits 1, 2, and 3 may now be accepted as part of the record.

(LRE Operating LLC Exhibits 1 through 3 were offered and admitted.)

MR. LARSON: And I'll pass the witness.

CROSS-EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Reynolds, I just have a couple of questions. I am looking at Exhibit 3.

A. Okay.

Q. If I am understanding what you are doing here, you are actually -- you got two separate initial pilot projects, you got the southwest quarter of section 32 and then the northeast quarter of 32; is that right?

A. There are two separate areas on one lease. I don't know if you would call them two separate projects.

Q. Okay. And then you have injectors on each of those quarter sections?

A. That's correct.

Q. Do you expect the influence from those injectors to extend into the northeast quarter in the southeast quarter?

A. Of course that's a little more technical than a landman can answer, but we are not anticipating that.

Q. And once you conduct the pilot project, what are

you anticipating in terms of unitization; are you looking to unitize section 32, do you think?

A. Again, I think that's premature on my part. We have to see what this does. But that would be kind of a logical step out from --

Q. Okay.

MR. FELDEWERT: That's all I have. Thank you.

EXAMINER McMILLAN: Okay.

EXAMINATION BY EXAMINER McMILLAN

EXAMINER McMILLAN: Were all royalty interests notified?

THE WITNESS: Of course, the state owns all the royalty.

EXAMINER McMILLAN: What about overrides?

THE WITNESS: The overrides were really not notified at this point, because it is just a pilot. It is all on one lease, and I believe all the overrides owners are the same. The owners, I might say, Mr. Examiner, are, for the most part, the oil companies that farmed out to SDX. And those were notified as --

EXAMINER McMILLAN: You can't definitively say?

THE WITNESS: No, sir.

EXAMINER McMILLAN: What pool is this?

THE WITNESS: What pool? I did give that earlier. It is the San Andres zone of the Artesia, Grayburg, San Andres Pool.

EXAMINER McMILLAN: It is 3,200, isn't it? What's the time schedule for the work?

THE WITNESS: I would anticipate once approved that they would start converting the wells and so forth pretty quick. I would say within the next few months, six months at best.

EXAMINER McMILLAN: Do you agree to present a written report within a year to the Division --

THE WITNESS: Yes, sir.

EXAMINER McMILLAN: -- to be added to the case file showing results of the injection?

THE WITNESS: Yes, sir.

EXAMINER McMILLAN: Where is the C-108 application?

MR. LARSON: Those were exhibits to the application. I have a set of copies here.

EXAMINER McMILLAN: Well --

MR. LARSON: Would you like them?

EXAMINER McMILLAN: Yes.

MR. LARSON: (Handing.)

EXAMINER McMILLAN: Did you supply a C-102?

MR. FELDEWERT: I have a copy by virtue of

their application.

EXAMINER McMILLAN: Okay. So these will -- what exhibits do you want to call them?

MR. LARSON: They are part of the record. They are part of the application.

EXAMINER McMILLAN: I don't have any further questions at this time.

MR. LARSON: I don't either. And I will say I didn't make extra copies because I was saving part of a tree.

EXAMINER McMILLAN: Good.

MR. LARSON: That's all I have for Mr. Reynolds.

EXAMINER McMILLAN: Thank you.

JOHN C. MAXEY

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

DIRECT EXAMINATION

BY MR. LARSON:

Q. Good morning, Mr. Maxey. Can you please state your full name for the record.

A. My name is John Maxey.

Q. And where do you reside?

A. Roswell, New Mexico.

Q. By whom are you employed and in what capacity?

A. Employed by Lime Rock Resources as a consulting petroleum engineer.

Q. For purposes of this matter?

A. That's correct.

Q. And were you retained by LRE to perform an engineering analysis of the prospects for the proposed pilot project?

A. Yes, I was.

Q. Have you previously testified at a Division hearing?

A. Yes, I have.

Q. And were you qualified as an expert in petroleum engineering during those hearings?

A. Yes.

MR. LARSON: I move for Mr. Maxey's qualification as an expert in petroleum engineering.

EXAMINER McMILLAN: Any objection?

MR. FELDEWERT: No objection.

EXAMINER McMILLAN: So qualified.

Q. And you are also familiar with the Division's order in case No. 14563?

A. Yes.

Q. And referring to Exhibit 2, which is the order, does it contain any findings of fact that are pertinent to LRE's current application?

A. Yes.

Q. And is there a finding regarding the San Andres Formation in the area of the proposed pilot project?

A. Yes. Within that order, it was found that the San Andres has been adequately defined by drilling and completion attempts, and it's continuous across the acreage, section 32.

Q. Does the order contain a finding regarding the status of LRE San Andres producing wells in Section 32?

A. Yes. The wells are in an advanced state of depletion and have a short remaining primary life.

Q. And, finally, does the order contain a finding pertaining to the offset wells in the area of review for each of the three wells that LRE proposes to convert for injection?

A. Yes. In that order, there are over 100 wells looked at as far as construction. And there were only two that were found that were inadequately cased and cemented.

Q. And are either of those two wells identified in the order located within the areas of review for the three wells that LRE proposes to convert to injection?

A. No.

Q. Could you identify the document marked as Exhibit 4?

A. Yes. Exhibit 4 is a structure map primarily of section 32.

Q. And who prepared this document?

A. This document was prepared by Stan Bishop, who is an area geologist for Lime Rock Resources, and we discussed this extensively as far as the preparation that went into it.

Q. And what does the structure map tell you about the San Andres formation in section 32?

A. This map firstly -- just to make a few points about the map. No. One, the yellow acreage is the continuous single state lease that Mr. Reynold's testified about. No. Two, the proposed injection wells are the ones with octagons around them, two in the northeast and one in the southwest. No. Three, Mr. Examiner, let me just point out, that B to B Prime cross section that you see on the map, there is no -- that will not be presented today in the interest of trying to keep these large exhibits down. Let's see.

As far as the geology from this map, the dip is from northwest to southeast. There's about 200 feet of dip from the northwest corner to the southeast corner.

Strike is primarily northeast to southwest, and that's -- this map was generated on the top of the San Andres, approximately 1,950 feet deep.

Q. And I will next ask you to identify the document marked as Exhibit 5.

A. Exhibit 5 is a cross section A to A Prime that runs from the southwest corner of the section to the northeast corner of the section. And I apologize for the size of this, but we are talking a pretty large interval, so these logs -- it is a small scale, trying to keep the size down.

Q. Who prepared Exhibit 5?

A. This exhibit was prepared by Stan Bishop and myself. We collaborated on the preparation of this document.

Q. Will you explain to the Examiner what information this cross section provides us in terms of the San Andres formation in section 32?

A. Sure. This is a stratigraphic cross section. It is hung on the top of the San Andres, which you will see at the top of the logs there demarcated with the SNDR acronym.

It shows the perforated intervals in the wells that are on the cross section within the San Andres. And this is basically the upper, middle, and lower San Andres. The top of the Glorieta is approximately 3,300 feet and down. This is pretty much the entire San Andres section.

Q. And does the cross section reinforce the Division's finding regarding the continuity of the San Andres?

A. Yes.

Q. And following up on Mr. Reynolds' testimony about the varying depths of ownership in the northeast quarter, what does the cross section here show?

A. Mr. Examiner, following up on Mr. Reynolds' testimony, the four wells on the right side of the cross section are basically from the northeast. And he testified to the fact that they had varying ownership in the 40-acre proration units in the northeast.

And so if you will look at the correlation well, which is the northwest state 17, the third one from the right --

EXAMINER McMILLAN: Yes.

A. -- that well is in the 40-acre proration unit which is the shallowest ownership they have in the northeast. They own down to 2,950.

So the two proposed injectors are on either side of that well. So stratigraphic equivalent is shown on this cross section to either side. And that's what in the application, the C-108s, is the lower depth of injection. Are you following?

EXAMINER McMILLAN: Keep going.

Q. The same question about the southwest quarter.

A. It is the same thing in the southwest, which would be five wells on the left side of the cross section, would be from the southwest.

Again, their shallowest 40-acre ownership is depicted by the Northwest State 30, which is the fourth well from the left correlation. 3,290 at the base of the log; correlating to the proposed injector where they have an actual deeper ownership in that 40 acres. We are only asking for an equivalent of I think it is 3,300 in the C-108 in the southwest.

It is a little complicated because of the varying ownership of the 40-acre tracts on the entire lease.

Q. In your opinion, would there be an advantage to injecting at a lower depth in the southwest quarter?

A. Yes. The reason we would like to go to the deeper depths that they actually own in the southwest, the Northwest State 29, which is an offset to the proposed injector, actually has multiple hydrocarbons in the lower San Andres. So it has potential for moving hydrocarbons with the flood.

Q. What is the estimated frac gradiant of the San Andres in this area.

A. .75 p.s.i. per foot.

Q. I next ask you to identify the document marked as

LRE Exhibit 6.

EXAMINER McMILLAN: Hold on a second. Thank you.

MR. LARSON: Sure.

A. Document No. 6 is a map I prepared that basically is very similar to the structure map as far as wells and well spots. But I expanded it to the east, so you can see the Washington 33 State 11 operated by Apache. It is a San Andres water flood unit.

Q. And did you personally prepare this map?

A. I prepared this map.

Q. And looking at the northwest quarter of section 32, will you point out the wells that LRE proposes to convert for injection --

A. In the northeast quarter?

Q. Yes.

A. Again, it is the two wells that are demarcated with circles and injection symbols in the northeast quarter on this map.

Q. And what are the numbers of this well?

A. Northwest State No. 1 and 3.

Q. And what producing wells in the northeast quarter will be influenced by the injected water?

A. I have drawn a line just so you could easily locate the producing wells that are surrounding the

injection wells in the northeast quarter.

Q. So all of those wells connected by the line will be influenced by the produced -- sorry -- the injected water?

A. Anticipated, yes, seven producers.

Q. And given the well pattern in the northeast quarter, do you believe that the injected water will be contained within the pattern?

A. Yes.

Q. And the same question for the southwest quarter, what is the well that LRE proposes --

A. It is the Northwest State 7, with a circle around it.

Q. And which producing wells in the southwest quarter will be influenced?

A. The five that also have the lines drawn connecting them.

Q. And given the well pattern in the southwest quarter, will the injected water be contained within the pattern?

A. Yes.

Q. So it's your opinion that there won't be an issue of injected water migrating out --

A. That's correct.

Q. And what is the maximum injection pressure LRE

proposes for the three injection wells?

A. .2 p.s.i. per foot is the state standard, so that would be 488 p.s.i.

Q. And what is the source of the water that LRE will inject for its title water flood?

A. The source of the water will be approximately 60 percent produced water, and makeup water will come from adjoining leases producing out of the Queen Grayburg, San Andres Formation that LRE operates.

Q. Are there any fresh water wells within a mile of the three injection wells that LRE proposes for its water flood?

A. No.

Q. Are you aware of any engineering or geologic data indicating that there might be a hydrologic connection between the San Andres and any underground source of drainage?

A. No.

Q. And moving to the document marked as Exhibit 7. Would you identify that document?

A. Exhibit 7 is a rate time curve for producing wells, for San Andres producing wells in the northeast quarter of the section.

Q. And did you prepare this document?

A. Yes, I did.

Q. And what is the purpose of your rate time curve?
A. I wanted to illustrate -- No. 1, I made a note on there that there's 160 acres in the northeast quarter or nine wells, so we're basically on an average of 18-acre spacing, roughly 20-acre spacing.
I did do a projection on primary. And Lime Rock is looking at 411 barrels EURs, estimated ultimate recovery -- 411,000 barrels. Sorry.
Q. Estimated recovery?
A. Estimated recovery, yes, EURs.
Q. And have you done a similar rate time curve for the southwest quarter of section 32?
A. Yes.
Q. And does that appear on the document marked as Exhibit 9?
A. Yes.
Q. And did you also prepare this document?
A. It's Exhibit 8.
Q. Exhibit 8?
A. Yes.
Q. Thank you. Did you prepare the document marked as Exhibit 8?
A. Yes.
Q. And what information are you able to derive from the graphs shown on Exhibit 8?

A. The same thing as the northeast --

THE WITNESS: Mr. Examiner, I have just broken these out, northeast, southwest to look at these individual parcels.

A. And this is the southwest. Similar information, eight wells on 160 acres. So basically we are on 20-acre spacing there. Estimated ultimate recovery on these wells, 237,000 barrels of oil.

You will notice there were four wells that were drilled back in about '09, so this is more recent production. Historically there's been a longer producing time in the northeast.

Q. And I next ask you to identify the document marked as Exhibit 9.

A. Exhibit 9 is core data. This property was originally operated by SDX. SDX is a low cost operator. They're very good at what they do. There was not a lot of data extracted from these wells when drilled.

There was some core data. I was provided that data from Lime Rock. And, basically, these three charts in this exhibit are a summation of the core data.

Q. And did you prepare this document?

A. I did.

Q. And what is it intended to depict?

A. The top two charts are basically permeability,

porosity cross plots. And I am using -- based on his core data, I am using a five percent porosity cut-off in looking at net pay. I have pretty decent correlation to the data, correlation coefficient.

Q. Would you next identify the document marked as Exhibit 10?

A. Well, let me go back to that real quick.

Q. Sure.

A. That lower part, the Northwest State 3, they did not take residual oil saturations. They only had residual oil saturations in the cores on the number 7.

The number 3 was on the left on the top graph. The Northwest State 7 is on the right. So the lowermost chart is just the residual oil saturation in the sidewall cores on the number 7.

What I wanted to illustrate with that was the residual saturations, over 20 percent in the upper part of the proposed injection interval. And you can see it grade off as you go down, so we've got somewhat of a transition zone in the San Andres.

Q. Anything further on Exhibit 9?

A. That's it.

Q. Moving onto No. 10, would you identify that document, please?

A. No. 10 is a document I prepared. And its of

reservoir data that was gathered from log analysis, sidewall core analysis, and empirical correlations.

Q. And what conclusions can you draw from the data that appear on Exhibit 10?

A. Basically, this is the data that went into the calculations, and I presented this for the Examiner.

THE WITNESS: Mr. Examiner, second row, average, cross plot porosity, that footage is -- I didn't note this but that's greater than five percent.

The average porosity in feet is calculated based on what's greater than 5 percent. I use that 5 percent as a cut-off. I just want to make sure you know.

A. There was testimony in the last hearing, a question from the Examiner about mobility ratio and there wasn't one provided.

I went back and looked. No special core analysis really to determine relative permeability curves. But I did make an estimate -- and this is just an estimate, it's really a guess.

I made a rough guess at end points on relative perm and basically calculated a mobility ratio of 2.2. And that's that bottom line.

And the only reason I did that was because of the question from the Examiner in the last hearing. 2.2 is

a good number for a flood if -- for the pilot and the flood, a potential flood. Anything greater than that one actually requires less injectors. The water is more mobile.

Q. And I will next have you identify the document marked as Exhibit 11.

A. Exhibit 11 is the calculation results based on the last two exhibits. This is really presented for your benefit. I didn't want to bore you with all the details going through them.

But primarily the first line, Original in place, is an important number, 5.8 million barrels in the northeast quarter and roughly 5 million barrels in the southwest quarter. Primary recovery factor, which is line six, roughly 7 percent in the northeast, 5 and 1/2 percent in the southwest.

EXAMINER McMILLAN: Okay.

A. Running through these numbers all the way to the second line from the bottom, calculated secondary to primary ratio, now these numbers are all based on a five spot water flood pattern in both the northeast and southwest.

These are not pilot numbers. Pilots are actually to get data, but these are calculated based on a five spot flood in both the northeast and southwest. 1.9 to

1 in the northeast. 2.6 to 1 in the southwest.

Now I would -- I do believe that the assumed water saturation of 35 percent may be a little optimistic based on the core data. And also this is calculated with the reservoir bubble point -- which I think there was probably free gas -- would have been free gas in this reservoir which would bring these numbers down also.

The bottom line to this I think it's very easy to look at this and look at a possible one to one as a good number for a secondary recovery operation.

And we'll talk about the offset flood where they are at too as an analogy in a minute.

Q. And referring back to Exhibit No. 6, you mentioned -- you've taken a look at the Apache, Washington State water flood. Did you look at that water flood as being potentially analogous.

A. Yes. Apache number -- Apache, Washington 33 is -- that flood is all of section 33. It's the entire section. And they have been injecting water in that flood since 2006 when they started.

They do have -- because everything is pretty -- is considered one unit, Queen, Grayburg, San Andres out here in the shallow area, they do have a couple of Grayburg Sands opening up.

I reviewed the testimony in that case. They really don't think those would contribute in their testimony. Primarily, they're contributing formations in the San Andres in the Washington 33.

Q. And when you say that case, was that the application for the Apache water flood?

A. Yes. And it was presented by BP, Apache now operates...

Q. And have you analyzed the production rates for the Apache, Washington water flood in section 33?

A. Yes.

Q. And I'll ask you to identify the final document, which is marked as Exhibit 12.

A. This is another rate time curve on the Washington State 33 lease water flood.

Q. And did you prepare this document?

A. I did.

Q. And how does the Apache Washington water flood perform?

A. They started injection in March of '06. They had response in 16 months. Using a rule of thumb of two-thirds fill up, the response being two-thirds of fill up. And the fill up time would be approximately 24 months.

And they have seven injection wells on the

acreage and 22 producers. So they have like a point 3 to 1 injector to produce a ratio. A five-spot flood, which is what Lime Rock would be looking at is a one to one ratio.

Now there is a potential to do something different after a pilot flood. You could end up with a line drive, but we don't know that yet.

But, anyway, I want to point out that they've got about a third of the injectors to producers which Lime Rock would like to do this with the pilots successful on a five spot basis, which is a one-to-one injector to producer ratio, which would be more efficient.

Q. And do you consider the Apache, Washington Water Flood to be a reasonable predictor of how LRE's pilot project might perform?

A. Yes. The Washington 33 with this lower ratio of injectors and also they have currently -- their reservoir barrel withdrawals are about three times their injection rate, so they are not even keeping up with withdrawals. But with those two items that I've mentioned, they are still looking at a .5 to 1 on their secondary to primary ratio.

So that is where I come back to, what I looked at, what their performance is pointing to is a one-to-one secondary, primary on a full-blown flood.

Q. And in your opinion, will the granting of LRE's application provide LRE with an opportunity to determine whether it will be able to recover economically oil that would otherwise be unrecovered?

A. Yes.

Q. And in your opinion, will the granting of the application serve the interest of preventing waste?

A. Yes.

MR. LARSON: Mr. Examiner, I move the admission of LRE Exhibits 4 through 12.

MR. FELDEWERT: No objection.

EXAMINER McMILLAN: Exhibits 4 through 12 may now be accepted as part of the record.

(LRE Operating LLC Exhibits 4 through 12 were offered and admitted.)

MR. LARSON: And I pass the witness.

CROSS-EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Maxey, could you look at Exhibit 6 for me, please.

A. Okay.

Q. That is the exhibit where you have your injection wells and then your producing wells around it?

A. Yes.

Q. If I am understanding you, those are existing

wells; is that correct?
A. Yes.
Q. You don't anticipate any new drills at this point in time as part of your pilot project?
A. Not as part of the pilot project, no.
Q. But what you would anticipate if you move to a water flood would be a five-spot pattern around your injecting --
A. Anticipating, but the pilot is going to point towards whether that is really a good assumption or if there are some permeability trends that may suggest a line or a stagger line drive.
Q. And if I look at your Exhibit 10, this is reservoir data.
A. Okay.
Q. You say this was gathered from log analysis, sidewall core analysis, and empirical correlations in your exhibit, that's what you say?
A. Right.
Q. Can you tell me what data from what well was utilized; in other words, did you gather this data from a particular well in the northeast quarter and then the south --
A. Primarily the wells on the cross section. I was trying to work with the wells on the cross section

because I knew this was coming up here.

Q. So the data that you utilized --

A. Mainly the injection wells, those three injection wells on the cross section.

Q. Let me catch up with you. So Exhibit No. 4 -- which shows your injection wells?

A. Is that the cross section?

Q. It has your --

A. Oh, yes, that would be correct, too.

Q. So you have one injection well in the --

A. Southwest.

Q. -- southwest quarter and then two injection wells in the northeast quarter?

A. Yes.

Q. And that's the data that's utilized to generate Exhibit 10?

A. Yes -- the reservoir data?

Q. Yes.

A. Yes.

Q. Okay.

MR. FELDEWERT: Those are all the questions I have. Thank you.

EXAMINATION BY EXAMINER McMILLAN

EXAMINER McMILLAN: The first point I want to make is that in your application, you had requested

500 p.s.i., but that's greater than .2 so you will be allotted the .2.

THE WITNESS: Okay.

EXAMINER McMILLAN: Now the next question I have is well No. 7.

MR. LARSON: Mr. Examiner, are you referring to the C-108?

EXAMINER McMILLAN: Yes. It's probably on page 3.

MR. LARSON: Thank you.

EXAMINER McMILLAN: So the existing TD of this well is 3,220; you're going to deepen to 3,300?

THE WITNESS: It will be not be deepened initially. This -- Lime Rock would like to include this. They have ownership down this to this depth. And this is complicated on this ownership.

But they're keeping their injection interval to the shallowest ownership they have 40-acre-wise. Okay? Because they don't want to get deeper than that and then have problems with injecting something they don't own in the southwest.

EXAMINER McMILLAN: Uh-huh.

THE WITNESS: So they're keeping that as shallow as possible. They are asking for that because if you'll look at the same map we are talking about

right here -- Exhibit 6 -- the Northwest State 29, which is an immediate offset to the northwest of the number 7 --

EXAMINER McMILLAN: Yes.

THE WITNESS: They completed that in the lower San Andres, which is this interval we are talking about, approximately 2,900 to 3,300. You know the primary injection interval right now is middle San Andres.

EXAMINER McMILLAN: Uh-huh.

THE WITNESS: This is lower San Andres we're talking about right now that you're asking about. The Northwest State 29 perforated in April of '09, they perforated and frac stimulated the lower San Andres with about 170,000 pounds of sand, and they produced that for four months.

It came on at ten barrels a day and 90 percent water cut. So it is not a hot priority as far as injecting into that interval. However, this is a pilot project and pilots you're looking for data; you're not necessarily looking for economics.

And they would like to have that flexibility -- if their pilot is panning out, they would like to have the flexibility to able to perforate that well in those depths. And they would also have to go in

and perforate the producers, because those producers that I've shown, other than the 29 -- you've got some other producers that aren't perforated in that interval.

So if you are going to obtain the science, you're going to have to perforate in that interval in not only the injector but the producers. But right now the focus is the middle San Andres.

Did I explain that well enough?

EXAMINER McMILLAN: It is basically depth severances?

THE WITNESS: As far as the northeast to the southwest, yes, there is a depth difference.

EXAMINER McMILLAN: And let's see.

THE WITNESS: They would do the same thing in the northeast. They don't have as deep of ownership.

EXAMINER McMILLAN: Are you going to run a cement bond log in here from where you have your four-inch liner?

THE WITNESS: Are you talking about if it's deepened?

EXAMINER McMILLAN: Yes.

THE WITNESS: If it were deepened, it would be -- let's see. Okay. So they've got the proposal, because that is five-and-a-half inch, so it would be a four-inch flush joint liner and then it would be

cemented and then you'd run a bond log through it.

EXAMINER McMILLAN: And if you do that, that will be a condition --

THE WITNESS: Yes. And it would also be a liner top test, too, pressure test the liner top. I mean, you are going to have 200 to 300 minimum overlap on the liner top to make sure you've got a good bond.

EXAMINER McMILLAN: And just for clarity, you looked at all the wells within a half-mile ARO and you did not see any remedial work required?

THE WITNESS: That's correct. And that was the same condition in the previous order, but I did go back and look at those.

EXAMINER McMILLAN: And what's the status of these wells right now?

THE WITNESS: They are all producing.

EXAMINER McMILLAN: Are you saying that they are near the economic --

THE WITNESS: Yeah. I have not discussed with Lime Rock the current economic situation, with the way oil prices are. But I am sure some of these are marginal.

EXAMINER McMILLAN: I have no further questions.

EXAMINER WADE: I don't have any questions.

MR. FELDEWERT: I do have one request, if I may, before we close on this record.

EXAMINER McMILLAN: Go ahead.

MR. FELDEWERT: I think you mentioned that they would be submitting a report to the Division within a year showing the results of their injection, and I ask that a copy of that report be provided to COG Operating as well.

MR. LARSON: I have no objection to that.

EXAMINER McMILLAN: Okay. At this point, we are going to take a five-minute break.

MR. LARSON: Are we still on the record in this case?

EXAMINER McMILLAN: We are off the record right now, but then we are going to come back.

(Brief recess.)

EXAMINER McMILLAN: Okay. At this point, I request final comments. I have no further questions. Any final statements?

MR. LARSON: My only statement, Mr. Examiner, would be that LRE has sustained its burden of proving that the application should be granted and asks that the case be taken under advisement.

MR. FELDEWERT: I have no further statement.

EXAMINER McMILLAN: Okay. With that in

mind, Case No. 15343 will be taken under advisement. And thank you very much.

(Time noted 9:19 a.m.)

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

_____, 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, August 6, 2015, 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 H. ALLANIC, CSR
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