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 15322
(cont'd)

APPLICATION OF KEY ENERGY RESOURCES, LLC, FOR APPROVAL OF A SALT WATER DISPOSAL WELL, EDDY COUNTY, NEW MEXICO.

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

JULY 23, 2015

Santa Fe, New Mexico

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

This matter came on for hearing before the New Mexico Oil Conservation Division, Michael McMillan, Chief Examiner, Phillip Goetze, Examiner, and Gabriel Wade, Legal Examiner, on July 23, 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.

REPORTED BY: ELLEN H. ALLANIC
NEW MEXICO CCR 100
CALIFORNIA CSR 8670
PAUL BACA COURT REPORTERS
500 Fourth Street, NW
Suite 105
Albuquerque, New Mexico 87102

A P P E A R A N C E S

For the Applicant:

Gary W. Larson, Esq.
Hinkle Shanor LLP
P.O. Box 0268
Santa Fe, New Mexico 87504
(505) 982-8623
glarson@hinklelawfirm.com

For the Lessees of the state minerals underlying subject section, BC Operating, Inc., (the actual lessee is Crown Oil Partners V):

Michael H. Feldewert, Esq.
Holland & Hart
110 North Guadalupe
Suite 1
Santa Fe, New Mexico 87501
(505)988-4421
mfeldewert@hollandhart.com

I N D E X

I N D E X (cont'd)

I N D E X (cont'd)

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

Exhibits Offered and Admitted

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

Exhibits Offered and Admitted

(Time noted 10:22 a.m.)

EXAMINER GOETZE: At this point we are moving onto the next case, case 15322. It's the application of Key Energy Resources LLC for approval of a salt water disposal well, Eddy County, New Mexico.

Call for appearances.

Off the record.

(Pause.)

EXAMINER GOETZE: Back on the record. Case 15322, call for appearances.

And at this point, I will hand over the hearing of this case to Michael McMillan so that all parties have a clean slate to begin with. Where is my Examiner?

EXAMINER McMILLAN: My name is a Michael McMillan, and I will hear case 15322, Application of Key Energy Resources LLC for approval of a salt water disposal well, 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, Key Energy Services. I have four witnesses.

EXAMINER McMILLAN: Any other appearances?

MR. FELDEWERT: May it please the Examiner,

Michael Feldewert with Santa Fe Office of Holland and Hart appearing on behalf of the lessees of the state minerals underlying this particular section, BC Operating, Inc., and actually the lessee is Crown Oil Partners V.

EXAMINER McMILLAN: Go ahead.

MR. FELDEWERT: Mr. Examiner, I do have an opening statement.

EXAMINER WADE: Mr. Feldewert, will you also have witnesses?

MR. FELDEWERT: I'm sorry. I have two witnesses here today.

EXAMINER McMILLAN: At this time, I would like opening statements.

MR. LARSON: I have no opening statement.

EXAMINER McMILLAN: Please proceed.

MR. FELDEWERT: Examiner McMillan, BC Operating and Crown Partners are here objecting to this application because Crown Partners has a lease for the New Mexico State Land Office that covers the east half of section 36, so we have a different circumstance than what we had in 2012 when Key was first before this body for injection authority. There was no state lessee at that time. There is now.

Crown took this lease because the formation

pool, section 36, were productive, and that includes the Brushy Canyon, which is a zone that they seek to inject into the Brushy Canyon being the lower part of the Delaware Formation. This formation is productive in a number of areas surrounding this proposed acreage. And this is a formation that's even more productive now that we have the advent of horizontal well technology.

We have brought a geologist here today who will confirm that the Brushy Canyon is productive under this section. He is going to show a direct correlation between the sands that you see under this section and other prolific fields nearby producing from the Brushy Canyon and other portions of the Delaware.

As important, BC Operating, which is the operating arm of the lessee here, has permitted two wells in the east half of section 36. They permitted a vertical well and they permitted a horizontal well that they plan to drill within a year.

Now while these wells are going to be initially completed in the Wolfcamp Formation, the company has budgeted to use these well bores to explore and study the Brushy Canyon and other intervals in the Delaware. And this we believe is going to provide additional information that will show that the Brushy Canyon is indeed productive under this state -- under

this particular section.

So we have a circumstance here -- it is kind of interesting -- where Key is claiming a right to use an existing well bore out there under what looks like a well bore assignment from Oxy, which I guess they are going to introduce into evidence.

So despite the fact they don't have a lease with the state land office, they don't have an easement with the state land office, they don't have a license with the state land office, they don't have any agreement with the state land office to use this existing well bore that was drilled by the prior state lessee, they claim a right to use the Grace Well.

And in addition to that, they claim the ability to inject, produce water into the minerals that are held by the state land office for the benefit of the state of New Mexico without any subsurface easement from anyone, including the state land office or the current state lessee.

The bottom line is that the New Mexico State Land Office and its beneficiaries, which include the citizens and the State of New Mexico and the school districts are going to receive absolutely no benefit from this proposed SWD. And since we now have a lessee of the state minerals under this section, a lessee that

believes the Brushy Canyon is productive, a lessee that is poised to examine and explore this formation, and a lessee that is actually moving forward with the drilling program to do just that, this application should be denied to avoid waste of oil and gas reserves in the Brushy Canyon that are held in trust for the citizens of New Mexico.

MR. LARSON: May I call my first witness?

EXAMINER McMILLAN: Please.

MR. LARSON: They haven't been sworn yet.

EXAMINER McMILLAN: I would like at this time for all the witnesses to be sworn in.

MR. LARSON: Thank you.

MR. FELDEWERT: Does that include our witnesses, Mr. Examiner?

EXAMINER McMILLAN: No. Let's just do Key first and then we'll go there.

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

WAYNE PRICE

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

DIRECT EXAMINATION

BY MR. LARSON:

Q. Good morning, Mr. Price. Would you please state

your full name for the record.

A. Wayne Price.

Q. And where do you reside?

A. In Rio Rancho.

Q. And what is the name of your business?

A. Price LLC.

Q. Is that a consulting business?

A. Yes, it is.

Q. And what types of consulting work do you do?

A. Oil and gas.

Q. And did Key retain you to prepare the application in this case?

A. Yes.

Q. And does your consulting work include oil and gas operational engineering?

A. Yes, it does.

Q. Have you previously testified in an examiner hearing?

A. I have.

Q. And was that in your role as the chief of the Division's environmental group?

A. Yes.

Q. At those hearings were you qualified as an expert in environmental engineering in oil and gas operational engineering?

A. I was.

MR. LARSON: Mr. Examiner, I move for Mr. Price's qualification as an expert in environmental engineering in oil and gas operational engineering.

EXAMINER McMILLAN: Objections?

MR. FELDEWERT: No objection.

EXAMINER McMILLAN: So qualified.

Q. Mr. Price, could you briefly recap the history of the Grace Carlsbad No. 1 Well that is the subject of Key's application for injection authority?

A. Right. The well was apparently drilled back in 1972. Oxy produced the well out of the Morrow and the Strawn Formation. It was a dual completion well.

Then it was plugged back and then they produced the other canyon. And then sometime in around 2010, Key Energy become operator of the well.

Q. And did Oxy approach Key about taking ownership of the well?

A. Yes, they did.

Q. Could you identify the document marked as Exhibit 1?

A. Yes. This is the well bore assignment and bill of sale from Oxy to Key Energy.

Q. And is Exhibit 1 a true and correct copy of the assignment?

A. Yes, it is.
Q. And would you next identify a document marked as Key Exhibit No. 2?
A. This is the change of operator from Oxy to Key Energy Services LLC. They did a 10-14-10.
Q. Is that the date of approval by the Artesia office.
A. Yes, it is.
Q. And is Exhibit 2 a true and correct copy of the change of operator that appears in the Division's records?
A. Yes, it is.
Q. Does Key have any auxiliary equipment at the site of the Grace Carlsbad No. 1 Well?
A. We do have.
Q. Can you detail that for the Examiner?
A. We have various and sundry tanks, we have a meter run, we have a heater treater, we also have a water station in the same proximity.
Q. And who owns the minerals underlying the location of the well?
A. The state of New Mexico.
Q. And who owns the surface?
A. A gentleman by the name of Mr. Daniel Stafford.
Q. And does Key have a lease agreement with Mr.

Stafford?

A. We do.

Q. And is Key in the process of negotiating new lease terms with Mr. Stafford?

A. We are.

Q. Has Key previously requested authorization to inject produced water into the Grace Carlsbad No. 1 Well?

A. Yes.

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

A. Exhibit 3 is the administrative application -- I'm sorry -- administrative application for a C-108 for the particular well in question. It was dated May 7, 2012.

Q. And is Exhibit 3 a true and correct copy of the C-108 that you prepared and submitted to the Division in 2012 on behalf of Key?

A. Yes.

Q. And when you submitted the application in 2012, did you include well records for any plugged and abandoned wells within the half mile area reviewed?

A. We did.

Q. And have those two wells been properly cemented?

A. Yes.

Q. Did Dr. Dennis Powers prepare a geological analysis of the proposed injection interval for purposes of the 2012 application?

A. He did.

Q. And will Dr. Powers be testifying today?

A. No. Unfortunately, he had unexpected eye surgery.

Q. He had travel restrictions because of that?

A. Absolutely.

Q. And did the Division approve the 2012 application for injection authority?

A. They did.

Q. And next I ask you to identify the document marked as Exhibit 4.

A. That is indeed the administrative order SWD-1344, dated July 17, 2012.

Q. Is that a true and correct copy of the administrative order?

A. It is.

Q. And in that order did the Division require any remedial work to be done on the two plugged and abandoned wells within the area of review?

A. No.

Q. And what is the injection interval identified in the administrative order?

A. The interval is from about 4,082 down to approximately 5,200, minus 200 for the plug that they want in the bottom. So from about 4,082 to about 5,000.

Q. Is this the same injection interval that is identified in Key's current application?

A. It is.

Q. And what is the maximum surface injection pressure stated in the administrative order?

A. It will conform to the default number, .2psi, which equates to about 816 psi-g at the surface.

Q. And that 816 psi number is indicated in the order?

A. It is.

Q. Is that the same maximum surface injection that's identified in Key's current application?

A. It is.

Q. Does the administrative order contain any requirements for converting the well to injection?

A. It does.

Q. Can you describe those requirements?

A. Sure. Just offhand, this was a completion well, a deep well. And, basically without reading it, I just will go back and just tell you, they want us to go in there and cut and pull the seven-inch.

After we do that, we would go back in and we

would perf and cement the 95-H all the way to the surface. And then we would run the seven-inch back in to the TD, the proposed TD about 5,200 feet. And then we would perf and cement that back up to the surface. So we would have two casing streams across the whole Delaware. And then we would perf it into the selected zones in that area.

Q. So it is not an open hole well?

A. No. It is a case hole.

Q. And Key will selectively perf at different depths?

A. That is correct.

Q. And does the well diagram in Key's current application satisfy the Division's requirement in the 2012 administrative order?

A. It does.

Q. And did administrative order SWD 1344 include a deadline for Key to commence injection?

A. It did.

Q. Was it two years?

A. Yes, right.

Q. And did Key meet that deadline?

A. No, they did not.

Q. And why not?

A. From the best I can understand, it was just a

corporate strategy change at that time.

Q. And did you also prepare and submit Key's current application for injection authority?

A. Yes, I did.

Q. Could you identify the document marked as Exhibit No. 5?

A. Yes. It's indeed the C-108 application that was submitted.

Q. And is Exhibit 5 a true and correct copy of that application?

A. Yes.

Q. And in conjunction with your submission of the C-108 to the Division, did you send personal notice to affected persons within the half mile area of review?

A. We did.

Q. And I'll direct your attention to pages 62 through 66 of Exhibit No. 5. Does the diagram on page 62 indicate the half mile area of review?

A. Yes, it does.

Q. And then the next several pages identify the affected persons within the half mile area of review?

A. Yes, it does.

Q. Did you send certified mail notice to all the individuals and entities identified on pages 63 through 66?

A. Yes, we did.
Q. I will next direct your attention to page 61 of Exhibit 5 and ask you to identify it.
A. 61?
Q. Yes.
A. That is the generic letter that we, certified mail, sent out to all of the offset operators, lease holders and surface owners.
Q. And you sent the same letter to all the affected persons --
A. We did.
Q. And did you have good addresses for all the individuals and entities identified on pages sixty- --
A. We did have a few returns, yes.
Q. And I next ask you to identify the document marked as Exhibit 6. Could you identify it?
A. This is a copy of the return receipts and the green cards that come back.
Q. And for all of those individuals and entities for whom you had good addresses, did you receive U.S.P.S. green cards in return?
A. We did.
Q. And after you sent out these notice letters, has it come to your attention that one of the affected or more of the affected persons may have conveyed their

interest in the area of review?

A. Yes, that is correct.

Q. And are you going to conduct initial investigation into that?

A. Yes, we are.

Q. And did Key also publish notice of your submission of the application on behalf of Key?

A. Yes.

Q. Would you identify the document marked as Exhibit 7?

A. This is indeed the public notice that was issued in the Current-Argus newspaper in Carlsbad, and it was dated March 31, 2015.

Q. And is this a true and correct copy of the Carlsbad Current-Argus affidavit of publication?

A. Yes, it is.

Q. Will this be a commercial disposal well?

A. It will be.

Q. And did you discuss Key's application with anybody at the state land office?

A. I have.

Q. Do you recall who you discussed it with?

A. I do. I had meetings with the assistant commissioner, Laura Reilly; the oil and gas manager, Ed Martin; also the director -- I believe that's director

Terry Worrell of the oil and gas division, their geologist; plus a number of staff members.

Q. And is the state land office going to require Key to get an SWD easement or pay any royalty to the state?

A. No, they are not.

Q. Are there any water wells within the half mile area of review?

A. No.

Q. What is the closest water supply to the well location?

A. The closest water supply is probably -- there's a -- there's a nonpotable construction well that the City of Carlsbad actually has to supply water for industrial purposes. And it is just outside of the half mile --

Q. That is not a potable water well?

A. No, it's not.

Q. And where is the Capitan Reef in relation to the well, sir?

A. Approximately five miles to the west of us.

Q. And in this geologic analysis which is part of the current application, does Dr. Powers discuss whether there's a stratigraphic connection between the proposed injection interval in the Brushy Canyon and the Capitan Reef or the Sheeps Draw?

A. Sheeps Draw being before Carlsbad's public well supply; they get their water out of what they call the Carlsbad limestone, which is, indeed, the Capitan Reef. And it is about five-and-a-half miles away from our site. And also the reef is in that area, so it's about five miles away.

Q. And does Dr. Powers offer an opinion on whether there is a stratigraphic connection?

A. He did. He did extensive work in that area, and his determination is there is not a connection.

Q. In your opinion, can he inject produced water into the Grace Carlsbad No. 1 Well without presenting a threat to the environment or to perfectable groundwater?

A. Absolutely.

MR. LARSON: Mr. Examiner, I move the admission of Key Exhibits 1 through 7.

MR. FELDEWERT: No objection.

EXAMINER McMILLAN: Exhibits 1, 2, 3, 4, 5, 6, and 7 may now be accepted as part of the record.

(Key Energy Services Exhibits 1 through 7 were offered and admitted.)

MR. LARSON: And I pass the witness.

CROSS EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Price, as I understand it, Key Energy has

claimed the right to use the Grace No. 1 well bore since October of 2010.

A. Yes.

Q. And is Exhibit No. 2 your change of operating form?

A. I'm sorry?

Q. Looking at Exhibit 2 your change of operating form --

A. Yes.

Q. And that is under a well bore assignment from Oxy?

A. Yes.

Q. Was Oxy the state lessee at the time?

A. It was my assumption they were, but I don't know the answer to that question.

Q. You don't have any indication that they were the state lessee at that time?

A. I do not know that.

Q. Do you know the status of the well in 2010 when they assigned the well bore to you?

A. The status of the well was a gas well. They had just -- I don't know the time frame, but they had quit producing.

Q. It had been producing from the Morrow?

A. Actually the canyon, I believe. It had produced

from the Morrow in the past, but it was --

Q. But the well was actually drilled by the lessee of the state minerals at the time?

A. I'm sorry?

Q. The well was actually drilled by the lessee of the state minerals?

A. That is my understanding.

Q. Does Key have a mineral lease from the state land office?

A. No.

Q. What right does Key have to access the Grace No. 1 well bore?

A. We have permission from the landowner.

Q. Anybody else?

A. We have no objections from the state land office.

Q. So it's your testimony that the state land office has no objection?

A. They have no objection.

Q. Where is the document that -- under which you claim a right to the Grace No. 1 well bore?

A. A document from who?

Q. I think you mentioned the surface owner.

A. We have an agreement with the surface owner.

Q. Where is it?

A. We don't have it here.

Q. You don't have anything to document your right to access the well bore here today?

A. I can only testify that we have that right. We have a current lease with Mr. Stafford. And we are in constant communication with him and we're under -- right now we are going through a renegotiation of our current lease with him.

Q. Why are you renegotiating what you call a current lease?

A. It's coming to an end, close to the end of this month.

Q. So is it your testimony that whatever lease you have -- we don't have it here today -- it terminates at the end of this month?

A. It is my understanding it terminates the end of this month. But we have -- it is our understanding that it is going to be renewed.

Q. Okay. So you have nothing in writing?

A. No, sir, I don't.

Q. In fact, we don't have any document here today evidencing your right to use or what you claim to use, the Grace No. 1 Well?

MR. LARSON: Objection. Argumentative.

Q. Your lease is not here today?

MR. LARSON: Asked and answered.

EXAMINER WADE: I am not sure we did get the answer.

Q. Do you have the lease here today?

A. No.

Q. It is not in this room?

A. Not that I am aware of.

Q. Do you have anything to document your right to use the Brushy Canyon Formation for injection?

A. I can say that we were previously approved to do that by the OCD and went through the normal process.

Q. I am not talking about your right to inject. I am talking about your right to access and utilize the Brushy Canyon Formation for your injection interval; do you have any subsurface easement?

A. With our agreement with Mr. Stafford, we assumed that.

Q. So you assume that because you have or you are going to have, I guess --

A. No. We do have.

Q. Expires at the end of this month?

A. Yes.

Q. So let's assume that you do have a lease.

A. Right.

Q. And that it is going to expire at the end of this month; of course, we don't have that here today.

A. Right.
Q. But as of August 1st, you are assuming that you are going to have a lease with the surface owner?
A. We will have it, because it's been re-upped, as we speak. Key's Houston land management people take care of that; I don't.
Q. And based solely on that lease, you think you have a right to go on using Brushy Canyon to inject salt water?
A. Not solely on that right, because the state land office has indicated to us that when it's a split estate -- we had a meeting the other day and their decision was --
Q. Okay. Hold on a second.
MR. LARSON: Would you let him finish his answer.
MR. FELDEWERT: It's hearsay. I don't have anybody here from the state land office. They are not here today to substantiate what he's saying.
EXAMINER WADE: I think you were asked the question and you aught to answer and we'll give it the weight it deserves.
A. When we had a meeting at the state land office --
Q. Who was at the meeting?
A. It was Ms. Laura Reilly, the assistant

commissioner. She works for Aubrey Dunn, the land commissioner. We had Mr. Terry Worrell. We had a number of staff members, Patricia Escabel, Ms. Jaramillo, ahh...

Q. Any attorneys?

A. I don't think so.

Q. Okay.

A. And at that time, it was their opinion that the surface owner owns the pour space in a split state and that we have -- they have no obligation to require us to get any sort of lease from them nor can they prevent us from doing that, that it would strictly be up to the Oil Conservation Division and the landowner.

Q. Okay. So if I am understanding it then, your opinion is that if you have a surface -- if you have a lease with a surface owner, that that gives the right to go and access the Brushy Canyon for purposes of injecting salt water?

A. I absolutely think it does.

Q. At the time that you applied for your injection permit on 2012, there was no lessee of the state minerals there; isn't that correct?

A. I don't know the answer to that question.

Q. If I look at what has been marked as Exhibit 3 --

A. Right.

Q. And I go to your notice list and I go to page 63 --

A. 63, okay.

Q. And if I look at tract 1 --

A. Right.

Q. The only entity you have listed under there is the state land office, correct?

A. That's correct.

Q. No lessees listed?

A. We notified the state land office because we knew of the split estate.

Q. And if there has been a state lessee, you would have listed that lessee and you would have notified that state lessee; is that correct?

A. That's correct.

Q. So I'm assuming, since you don't have one listed here, back in 2012, there was not a lessee of the state minerals?

A. I honestly don't know.

Q. And if there was I guess you didn't give notice?

A. If there was, we didn't give them notice, that is correct.

Q. You obtained your injection authority then in 2012 under Division Order that's marked as Exhibit No. 4; is that right?

A. Correct.

Q. And then, if I am understanding you -- and I think you testified to this -- in July of 2014 you received a notice of violation from the Oil Conservation Division?

A. From the Hobbs district, that is correct, the wells in the Carlsbad district.

Q. And that was because you had not commenced injection authority over two years after receiving the 2012 order, correct?

A. That's right. But I would like to explain something there. We had issued and asked for a one-year extension. I got that extension verbally from the director. However, in all fairness, a copy, the final copy of the letter from Key is not showing up in OCD's files. We felt very certain that we sent it in, and it is not showing up in the files.

Q. But the authority expired?

A. The authority to inject expired, but the one-year grace period did not. We were within that one-year grace period.

Q. Did you commence injection?

A. I'm sorry?

Q. Did you commence injection?

A. No, we were not injecting.

Q. Why not?
A. Once again, that was a -- that was a corporate management decision strategy that I wasn't part of.
Q. Who told you it was a corporate management decision?
A. Well, that was something that I have certainly discussed with several of the corporate people with Key Energy.
Q. So you discussed it with them?
A. I did.
Q. And what did they tell you?
A. They said it was a corporate decision, that they were going to forego reentering that well at this time.
Q. Did they say why?
A. They didn't really give me a reason why other than it was -- it was a high level corporate decision that was way above my pay grade.
Q. But they didn't tell you why?
A. No, they did not.
Q. Okay. And let's see. So that notice of violation was issued in September of 2014, right?
A. Which office did it come out of?
Q. Energy and Minerals Department.
A. Out of where? I don't have a copy of it in front of me.

Q. You don't recall?
A. I kind of recall.
Q. Do you remember it being signed by Maxi G. Brown, district office.
A. Out of the Hobbs office. The well's in the Carlsbad office.
Q. So the district one office?
A. For some reason.
Q. Is there a reason why you waited over six months before re-filing your application?
A. I received directives from Key Energy to -- they asked me to go ahead and try to re-permit the well.
Q. Did they say why their corporate strategy had changed?
A. No.
Q. It didn't have anything to do with the oil prices?
A. Sorry. I don't know the answer to that.
Q. If I look at your current application which is marked as Exhibit 5 --
A. Right.
Q. -- and I go to what's been marked -- I go to what has been marked as page 5 --
A. Exhibit 5, Page --
Q. Page 5.

A. Page 5.
Q. You got it.
A. Okay.
Q. Under paragraph 3, do you see where it says, Since the current condition is 7-inch casing and this well is unknown, and it goes on; do you see that?
A. I do.
Q. Is that -- so does that mean that in this entire period of time that the companies had this well bore you've done nothing with it to determine the current condition of the 7-inch casing?
A. That is correct.
Q. If I then go to the -- you still list that as a need, correct?
A. I'm sorry?
Q. You still list that as a need, to determine the condition of that 7-inch casing?
A. That's correct.
Q. And then if I go to what has been marked as Exhibit No. 4.
A. All right.
Q. Which is the Division's order back in 2012.
A. Exhibit 4?
Q. Yes.
A. This is the SWD, the administrative order.

Q. Correct.
A. Okay.
Q. I am looking down there. "It is therefore ordered that" -- do you see that?
A. Which page?
Q. Page 1.
A. Okay.
Q. We are near the bottom. And there's three little -- A, B, and C?
A. Yes.
Q. Was any of that work performed?
A. No.
Q. So the company has done basically nothing to advance the injection in this well?
A. That is basically correct.
Q. Now, I tried, Mr. Price, and maybe I missed -- I looked at your current application marked as Exhibit No. 5.
A. Right.
Q. And I looked at the application that you filed back in 2012, which is Exhibit No. 3.
A. Correct. Okay.
Q. And I really didn't find any differences?
A. There's hardly any differences, if at all, except for the date.

Q. You just re-filed the same application?
A. Basically, yes.
Q. You didn't do any update?
A. No.
Q. In fact, if I look at the verification by Mr. Powers, where would I find the verification in Exhibit No. 5?
A. It would be starting on page -- page 22.
Q. Page 60?
A. That's not the verification, I don't think.
Q. Why don't you go through it and tell me if I am right or not.
A. Okay. Page 60.
Q. Is that the verification?
A. Yes.
Q. And that is over -- what? -- three years old?
A. That is correct.
Q. And his report that you were going to which is on page -- it starts on page 21 --
A. Okay.
Q. That is likewise over three years old?
A. That is correct, assuming the geology hasn't changed.
Q. Let's go to Exhibit 5.
A. All right.

Q. And let's go to page 63.
A. Okay.
Q. Let step back a moment. Go to page 62.
A. 62, okay.
Q. The same tract area map?
A. Yes.
Q. That we saw in 2012 in Exhibit 3?
A. Correct.
Q. And then go to page 63.
A. Okay.
Q. Starting there, don't we have the exact same notice list?
A. You are right.
Q. You did not update?
A. I did not.
Q. And in fact, if I look at tract 1, which is where this section is located, section 36, you don't even list Crown as the lessee of record?
A. We did send Crown a notice.
Q. Who did you send the notice to?
A. It went to --
Q. I thought it went to BC Operating?
A. You are right. The person who called and I talked to was Mr. Hopson. I am not sure if that's Mr. Hopson there or not.

Q. Basically, you didn't update your records and when you sent out your notice under your notice letter here in March, you didn't even bother to see if there was a current lessee?

A. I think you are right about that.

Q. In fact, you didn't update any of your notices?

A. That is correct.

Q. Now, I am looking at Exhibit No. 6.

A. Right.

Q. Does this contain all of the green cards that went with your notice letter?

A. To the best of my knowledge, it does.

Q. I don't see a green card in here to indicate that you actually provided a copy of this application to New Mexico State Land Office as you represent on Page 3.

A. We sent them one for sure. And if it's not there, either it didn't come back or I didn't scan it.

Q. So we don't have any record evidence here that you actually sent notice -- the actual notice of the application or even this hearing to the state land office?

A. Can I go through the green --

Q. Sure. I want to make sure I didn't miss anything.

A. There is a notice for the State of New Mexico

Commissioner of Public Lands.

Q. Where is that?

A. These pages aren't numbered. It is in kind of the same area -- it's in the same one where the City of Carlsbad was noticed.

Q. Okay.

A. And we met with them.

Q. So you did provide notice to them on March 30th? I don't see a return receipt, I don't think, do I?

A. No. We did not get a return receipt back.

Q. Okay. If I go to Exhibit 5.

A. Okay.

Q. I'm looking at -- so that's your current application. And I go to what you marked as page 3.

A. Okay.

Q. This is the application requirements, correct?

A. Authorization to inject; is that right?

Q. Uh-huh. And these are all the requirements by the Division to give you standing to seek injection?

A. Right.

Q. And these must be met?

A. Right.

Q. If I go to section 7 --

A. Okay.

Q. -- proposed operations included, and I go to

paragraph 4, it says, Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; do you see that?

A. Right.

Q. And the receiving formation here is the Brushy Canyon?

A. Yes.

Q. So as you read this you're providing water analysis from the Brushy Canyon -- correct? -- because that's your receiving formation?

A. I would like to defer that to Mr. Gutierrez because I think he was going to talk about that.

MR. LARSON: Okay.

Q. Wait a minute. You signed this?

A. Yes.

Q. And you verified that all the information was provided?

A. Right.

Q. And you read this as requiring that you provide an analysis of compatibility with receiving formation, correct?

A. The way I interpret that was that the water that we were going to inject into this formation, we need to have the analysis of that water. And then we did that,

to the best of my knowledge. But as for the compatibility, I'd like to defer that question to Mr. Gutierrez.

Q. But in order to be able to compare it, you have to have a water analysis from the receiving formation -- correct? -- otherwise it doesn't do you any good?

A. Once again, I want to defer that question to the geologist.

Q. You know where I am going here?

A. Yeah, I do.

Q. Did you provide the Division with the water analysis from the receiving formation?

A. Did I?

Q. Did your application, did you provide the Division under your application that you verified with the water analysis with a water analysis from the receiving formation?

A. I do not believe we did.

Q. In fact, instead, isn't it true, that you provided only a water analysis from the Bone Spring Formation?

A. It was the Bone Spring and then a mix of Bone Spring and Morrow water and Delaware water.

Q. Step back.

In compliance with section 74, you didn't provide

the Division in Cardinal Laboratories with any source water from the receiving formation?

A. I did not.

Q. And therefore when they did their comparisons, they had no source water for the receiving formation?

A. The comparison aspect I am going to defer to another witness.

Q. Let's turn to -- where would I find the data that that complies with this requirement, Mr. Price?

A. Are you looking for a water analysis that we are going to anticipate to inject?

Q. No. I am asking for what you provided in compliance with section 74.

A. I did not take a sample per se of the Brushy Canyon. I can say, though, that the mix of water that we had could have Brushy Canyon water in that mix. But I did not identify it as Brushy Canyon only.

It would be -- we have what we call a mix tank in which there are -- different formation water go into that same tank. We took a sample of that tank, and we also took some Bone Spring water, a sample of. That is the best I can answer your question.

Q. Let's go to page 51 of Exhibit 5.

A. Okay.

Q. Is this what you are talking about?

A. Yes.
Q. And based on these records, it appears that the Cardinal Laboratories at someone's direction, either you or someone else, did a comparison of water from a produced water tank; that's the first line on 51, correct?
A. The produced water tank is the mixed tank that I am talking about and Key Energy owns that tank and actually that was located at our BKE disposal. And that is a mix of water from several formations.
Q. And then they compared it with produced water from the Bone Spring?
A. No. There was no comparison made by Cardinal Labs. Cardinal Labs just performed the analysis of those two samples submitted.
Q. And nothing from the Brushy Canyon?
A. Only -- except for the fact that the P tank contained various amounts of water that some could be from the Brushy Canyon.
Q. Could be?
A. That is right, could be.
Q. And how old is the sample that you provided to the Division under your 2015 application?
A. They're the same age as the original application.
Q. So three years old?

A. That is correct.
Q. And then you provided a fresh water analysis?
A. Yes.
Q. Is that likewise over three years old?
A. That is correct.
Q. So you are seeking approval from the Division to inject salt water into the Brushy Canyon without any subsurface, easement, or license from the state land office -- right? -- you have nothing from the state land office?
A. We are not required to.
Q. Using a C-108 that's not been updated since 2012?
A. We submitted basically the same application because we thought it had merit.
Q. Without providing any analysis of the water and the zone in which you seek to inject?
A. Except for the P tank of which we know there was probably some Brushy Canyon water in it.
Q. You know that there was "probably"?
A. That's right. Because it is a mix of formation water.

MR. FELDEWERT: That is all I have.

EXAMINATION BY EXAMINER McMILLAN

EXAMINER McMILLAN: For clarity, for the record, you did notify the City of Carlsbad?

THE WITNESS: Yes, we did.

EXAMINER McMILLAN: And the next question I have is when I looked on imaging I didn't see a porosity log through the injection interval. How did you pick the interval?

THE WITNESS: Mr. Examiner, we have expert witnesses that will handle your question or answer your question. I am probably not the guy to answer that.

EXAMINER McMILLAN: You also have an engineer with you?

THE WITNESS: Yes. We have a petroleum engineer and we have a geologist and we have a petrophysicist.

EXAMINER McMILLAN: And the next question I have, your 2015 proposal is exactly -- the well proposal is similar to the 2012; is that correct?

THE WITNESS: That is correct.

EXAMINER McMILLAN: So after SWD 1344 was approved there were certain procedures that were required, right? Stipulations?

THE WITNESS: Stipulations in the order, that is correct.

EXAMINER McMILLAN: So did you consider the stipulations in SWD 1344 that the state required not relevant and why didn't you include those? Because I

didn't --

THE WITNESS: Mr. Examiner, I'm not quite following your question.

EXAMINER McMILLAN: We agree that your 2012 or 2013 --

THE WITNESS: We had an approved order to inject with those conditions.

EXAMINER McMILLAN: But then I didn't see any of these -- the 2012 conditions as part of the 2015, and I want to know why not.

THE WITNESS: That is a very good point. Actually, upon advice of my attorney, this is a totally separate application. And I think I had even conferred with maybe some of your staff members or engineers, and saying that it is a totally different application because the other one expired and you have to reapply. And that is what I did.

EXAMINER McMILLAN: So you didn't take into account any of the requirements, added stipulations?

THE WITNESS: No. Because in my mind that would have been superseding your re-evaluation; in other words, I didn't want to -- if the application expired, then upon the advice of my attorney, is that it is a brand new application, and so if we tried to go in there and say, Well, this is what you guys did before, you

know -- I mean we would like to hang our hat on the fact that you did in indeed approve this application for injection and you went through the complete process of taking a look if it would be safe to do so, and it was approved. However, to my understanding, that would probably not have standing; that we would have to probably just reapply. And that's what we did.

EXAMINER McMILLAN: I have no more questions.

EXAMINER WADE: I have a question regarding notice. I thought you testified in your direct that other interests were located that may not have received notice.

THE WITNESS: That is correct.

EXAMINER WADE: What were those interests?

THE WITNESS: To the best of my knowledge, there were two parties, one of them was a rancher, we think is a ranching party, and the other is a company. It is -- I believe Chapperel has left New Mexico. And there was a company called could Colby that we think have picked up their interest. It is right on the edge. And so we just want to be -- we want to be safe, we want to make sure that everyone gets proper notice. And so we --

EXAMINER WADE: And notice was sent prior to

this hearing?

THE WITNESS: No. We just found out yesterday.

EXAMINER WADE: So at a minimum, this would have to be continued?

THE WITNESS: I have to have the attorney answer that.

MR. LARSON: I have several questions for redirect.

EXAMINER McMILLAN: Please proceed.

REDIRECT EXAMINATION

BY MR. LARSON:

Q. Mr. Price, I direct your attention to Exhibit 5.

A. Okay.

Q. It's the current application, specifically page 30.

A. Okay.

Q. Is that a porosity log that appears on page 30?

A. Yes.

Q. And that was prepared by Dr. Powers?

A. Correct.

Q. And I next direct your attention to Exhibit 4.

A. Okay.

Q. That is the administrative order.

A. Okay. I have it.

Q. If I understood the Examiner's question properly, I think he was asking if he had performed the requirements in subparagraphs A, B, and C towards the bottom of page one.

A. Okay.

Q. Aren't those things that you would do upon reentering the well?

A. That is correct.

Q. And have you had discussions recently with the state land office regarding the identity of a mineral lessee in the area of the well?

A. Yes.

Q. And who did they identify as the lessee?

A. Crown Petroleum.

Q. Was it MRC Permian?

A. That is correct.

Q. And did the state land office give you any indication that Crown was the lessee?

A. None at all.

MR. LARSON: That's all I have.

EXAMINER McMILLAN: Thank you. I have no further questions.

MR. FELDEWERT: I may have one.

EXAMINER McMILLAN: Please proceed.

RE-CROSS EXAMINATION

BY MR. FELDEWERT:

Q. Who told you that the lessee was MRC Permian?

A. I want to make sure I provide an accurate, precise answer here. And I got to think about this just a little bit, because I am having to recall who I talked to and when.

But when we did a search -- I did a search with the state land office, I believe -- and I can't -- Ed Martin, the oil and gas manager, directed me over to a gentleman's name. And then he had indicated that it was MRI or MRC Permian, so I knew it was that company because I had discussed it with the state land office.

Q. But you don't recall who that person was?

A. I can find out.

Q. Did you provide notice to MRC Permian?

A. I would have to look --

Q. I may have missed it. I've just have been paging through your green cards, and I don't see notice to MRC Permian.

A. I don't think I did.

EXAMINER McMILLAN: Thank you. Next witness.

MR. LARSON: Stephen Pattee.

STEPHEN PATTEE

having been first duly sworn, was examined and testified

as follows:

DIRECT EXAMINATION

BY MR. LARSON:

Q. Good morning, Mr. Pattee. Please state your full name for the record.

A. Stephen Pattee.

Q. And where do you reside?

A. Austin, Texas.

Q. And by whom are you employed and in what capacity?

A. Lonquist and Company, a petroleum engineering consulting firm, as a petroleum engineer.

Q. And does your educational background include the study of petroleum engineering?

A. Yes. I have a bachelor's degree in mining engineering from Penn State University and a master's in petroleum engineering from Texas A & M.

Q. Have you previously testified at a Division hearing?

A. Yes.

Q. And during that hearing, did the Examiner qualify you as an expert in petroleum engineering?

A. I was, yes.

Q. And do you have personal knowledge of the matters addressed in Key's application?

A. I do.

MR. LARSON: I request that Mr. Pattee be qualified as an expert in petroleum engineering.

MR. FELDEWERT: Just one question.

VOIR DIRE EXAMINATION OF STEPHEN PATTEE

BY MR. FELDEWERT:

Q. Lonquist and Company, where are they located?

A. Austin, Texas, and Houston, Texas.

Q. And you said you are familiar with -- have your responsibilities included the Permian Basin of New Mexico?

A. Yes.

Q. How many projects have you been involved in in the Permian Basin?

A. We are currently involved with more than a dozen SWD well applications, well bore designs.

Q. When you say "we," I asked you.

A. Me, me personally, well over a dozen right now.

Q. In the Permian in New Mexico?

A. Yes. In Lea County and in Eddy County specifically.

MR. FELDEWERT: I have no objection.

EXAMINER McMILLAN: So qualified.

BY MR. LARSON (cont'd):

Q. And what was Lonquist and Company tasked with in

relation to Key's application for injection authority?

A. We were asked to identify or determine whether the proposed injection interval had commercial potential for production of hydrocarbons.

Q. And what was the starting point for the Lonquist analysis of the injection interval?

A. Our first approach was to do -- was to conduct a well search in the area surrounding the Grace Carlsbad Well and identify if there's any production history out of the Brushy Canyon.

We evaluated multiple wells. We started with the half-mile review and expanded that investigation out to a mile and focused on all well bores that had production history and identified where they produced out of and created some exhibits for this.

Q. And after you identified those wells, what was your next step in your analysis?

A. Our next step in our analysis was to, from the wells identified, see if we could get enough well bore electric log data that could be utilized to perform a petrophysical evaluation of the formation to determine if hydrocarbons were present in commercially recoverable quantities.

Q. And I ask you to identify the document marked as Key Exhibit No. 8.

A. Exhibit 8 is a map which depicts a portion of our investigation. There is a -- the Grace Carlsbad Well is the black circle in the center of this map.

There is a half mile area, radius drawn around that and then extended out to one mile, so there is a one-mile area and a half-mile area.

This map identifies according to publicly available records the status and nature of the well bores found within this area of investigation.

Q. And was this document generated under your direction and supervision?

A. It was.

Q. By a Lonquist employee?

A. Yes, sir.

Q. The wells identified in Exhibit 8, are any of these wells permitted by BC Operating?

A. There are two. The wells are identified here with the last five digits of the API listed above or near the well bores or the well locations.

The well identified as 42666 is a vertical completion with an active permit by BC Operating, and well 42729 is a horizontal completion which is permitted as BC Operating as the operator.

Q. When you say "completion," has the well been drilled?

A. No. To my knowledge neither one of them have.
Q. But they have been permitted?
A. Yes.
Q. Could you briefly discuss the other wells identified within your mile radius?
A. There were several gas producers, there was one brine well and one other salt water disposal injector. The gas wells in a following exhibit will show where records indicate these wells produced out of or injected into.

The key -- the legend on the right-hand side of the page indicates whether it is an active gas well plugged, permitted, location, et cetera, for identification purposes.

Q. And that segues us to your Exhibit No. 9. Could you identify that for the record?
A. Exhibit No. 9 summarizes all of the well production within this one-mile area of investigation and identifies the intervals that these wells appear to have produced out of according to OCD records.

This chart also indicates the approximate depth of the proposed injection interval. And it can be seen on here that the majority of the wells located within one mile have produced out of deeper formations, primarily the Morrow as the key production in this area.

There was one shallow producer in here and one shallow injection well. And that well is on Exhibit 8, I believe is identified as 01908 and is a shallow SWD well. So you can see that there's no active production within the interval of the Brushy Canyon or the target interval for this proposed well.

Q. Would it be fair to say there was no historical production from the Brushy Canyon, based on your review of OCD records?

A. To answer that question leads into the next exhibit, because we have some historical initial potential testing that we also evaluate or review.

To answer that, if I may, Exhibit 10 -- our actual area of investigation, we looked at an enlarged area to find well data which could be used to feed our petrophysical model for the evaluation of this proposed injection interval. And you will also see the location of the Grace Carlsbad, the half mile, the one-mile radius which match Exhibit No. 8.

In addition, further details on this map include, wells surrounded by a red circle indicate where initial potential tests were conducted on wells. The initial production test summary is indicated by at what depth the test was performed, the resulting production or oil that was identified and measured during the test.

And it can be seen on here that per these IP tests that were in near, around, or through this injection interval the quantities of oil were identified as non-commercially productive. An example being one of the wells here, API 33788, which is just within the one-mile radius, 4993 is the depth at which it produced which is within our injection interval.

The IP test produced only 14 barrels of oil, with 50 barrels of water. As a result of these IP tests, to our knowledge none of these wells evolved into producing wells within these intervals tested.

Additionally on this map, we have some wells indicated where we found well log data to be evaluated, to be reviewed. And we have identified one well as an interpreted well. It's API 32566, I think.

UNIDENTIFIED VOICE: 560.

A. 560, thank you. 32560 just to the south and east of the Grace Carlsbad Well. This was the well that the data was gathered from to feed our petrophysical model.

Q. Mr. Pattee, referring you back to your data there, sort of in the northwest of section 32, you identify four wells all with 14 barrels of oil and 50 barrels of water --

A. It is the same well that was tested four times. Four different intervals within that well and --

Q. And would you consider that to be commercially producible hydrocarbons?

A. It depends on the economics, but I would say based on the current oil market, no, it is not commercially producible.

Q. And as far as you know after that IP data was generated, no production was taken out?

A. To my knowledge this well was never produced.

EXAMINER McMILLAN: I need some clarity on the map. What does purple represent?

MR. LARSON: I was just going to ask him. I am going through each of the colors.

THE WITNESS: There's a legend, lower right-hand corner on the map. There is a purple swatch here. Wells with Delaware IP tests --

MR. LARSON: We are on Exhibit 10.

THE WITNESS: Yes. Right here there is a legend. And the purple is loaded image files from State OCD files, so we found -- we went to the OCD site and found imaged open hole well logs. And we used those to evaluate geological and petrophysical characteristics.

The green is the well that we digitized. It will be discussed in further testimony after I am off here. It was digitized, and that digital data was used to feed our petrophysical evaluations.

Q. As you just indicated, Mr. Brian Davis, who is a petrophysicist, will give us further testimony about the --

A. Yes.

Q. -- about the formation?

A. Yes.

Q. Have you personally reviewed his petrophysical analysis?

A. Yes, I have.

Q. And what conclusion did you draw from review of his analysis?

A. His summary, the outputs of his model along with the area of investigation of potential production, historical production, the indications are that this interval is not of commercially producible hydrocarbon quantities.

Q. And in your opinion, will Key's proposed injection produce water into the Brushy Canyon present a threat to hydrocarbon production?

A. No.

Q. And I neglected to ask you this, were Exhibits 9 and 10 prepared under your direction and supervision?

A. They were.

MR. LARSON: I move the admission of Key Exhibits 8, 9, and 10.

EXAMINER McMILLAN: Any objection?

MR. FELDEWERT: No objection.

EXAMINER McMILLAN: Exhibits 8, Exhibit 9, and Exhibit 10 may now be accepted as part of the record.

(Key Energy Services Exhibits 8 through 10 were offered and admitted.)

MR. LARSON: And I pass the witness.

CROSS-EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Pattee, let me ask you a couple of questions and I will start with Exhibit 8. If I am understanding your testimony, you or someone chose to limit your analysis to just the area within the one-mile circle shown on Exhibit No. 8?

A. This is -- the exhibit that we produced here limits that area, that's correct.

Q. Okay. So your analysis is just limited to the one mile around the proposed injection well?

A. That is not correct. Exhibit 10 indicates that that area actually extends a considerable distance away from the well.

Q. Well, I'm trying to figure out does Exhibit 10 then -- I am assuming, maybe that's a better exhibit -- that reflects your -- that's the area that you took into

account in your analysis?

A. Our analysis actually included out to two miles and maybe just a little bit more than two miles to gather offset well data, see if there was well log, particularly digital well data that could be fed directly into our petrophysical analysis.

The nearest L.A.S file, digital file, was found to be approximately five miles away, which we felt was too far away for an accurate, reasonable evaluation. So our investigation went out at least that far to find candidates for our survey.

Q. For digital files?

A. For digital files, correct.

Q. So your analysis was limited to digital files?

A. No, sir.

Digital files to feed the petrophysical, any IP testing, which some of that data is shown on Exhibit 10, completion production history to populate exhibits such as Exhibit 9, our producing interval chart for an evaluation. So we could get a full picture of the target interval, the Brushy Canyon, and in this area will this proposed injection well influence any type of future production.

Q. And do you have any map that would show us the wells that you took into account in this area outside of

what we see on Exhibit 10?

A. I have one more exhibit which took -- basically expanded Exhibit 8 out to two miles.

Q. Do you have that?

A. I do.

Q. May I see that?

A. Yes.

(Pause.)

MR. LARSON: Mr. Examiner, this is an exhibit we were possibly going to use as a rebuttal exhibit so it is not marked.

MR. FELDEWERT: Okay. You can mark it.

MR. LARSON: Can you give us a minute to mark the exhibit, because he has asked the direct question about the map that goes out two miles and we are more than willing to put it in the record.

EXAMINER McMILLAN: On the condition that it be supplied as a formal part of the record, that is fine.

MR. LARSON: Sure.

THE WITNESS: We are prepared to do that.

EXAMINER McMILLAN: That is acceptable.

MR. FELDEWERT: Why don't you do it as 10-A?

MR. LARSON: That will work. Let the record reflect that based on a question from Mr. Feldewert,

Mr. Pattee is marking an exhibit, Exhibit No. 10-A.

MR. FELDEWERT: Thank you, sir.

EXAMINER WADE: Is there going to be enough?

THE WITNESS: Yes, I have enough copies.

EXAMINER McMILLAN: Please proceed.

BY MR. FELDEWERT (cont'd):

Q. Mr. Pattee, I am looking at what you marked kindly as Exhibit 10-A. And if I understand what you were telling me earlier, does this map reflect the wells that you took into account in your analysis -- that you looked at for purposes of determining what to take into account in your analysis?

A. That is correct.

Q. Is that the best way to say it?

A. Yes.

Q. Okay. And you didn't examine anything outside of this two-mile radius?

A. There were some IP tests. I don't have a map prepared. There's some IP tests to the north at approximately the two-mile or just outside of the two-mile area of influence.

They were tested and they showed similar results, but I don't have that exhibit here.

Q. But this is what we can rely upon as the area

that you examined for purposes of determining what to take into account for your analysis?

A. Yes, sir, that is correct.

Q. So you did not examine then the -- you didn't take a look at the wells in the Carlsbad South Field that produced from the Brushy Canyon up in section 24, which would be to the north?

A. No, we did not.

Q. And you didn't take into account the wells in the Happy Canyon field which produced from the Brushy Canyon as well as the Cherry Canyon?

A. Which section is that?

Q. To the west over there in sections 33 and, in part, 34.

A. No, we did not.

Q. And I don't see -- and I believe -- and then you mentioned that -- and along those lines, if I look at Exhibit No. 10, it sounds like you did some analysis that you are going to show us based on what you identify as your interpreted well?

A. That is correct.

Q. And with respect -- do you have a structure map?

A. I believe that is in further testimony following mine.

Q. Have you reviewed that?

A. I have not reviewed that structure map, no.
Q. Are you aware that your interpreted well is down dip of section 36, structurally lower?
A. Structurally lower, yes, we are aware of that.
Q. And are you aware that there are thinner sands there?
A. I understand we created a cross section through these as part of the review. And I don't recall seeing the sands thinning considerably in that 2,900 feet. There were some differences, but it was our opinion in this cross section review that the intervals were correlative and therefore applicable back to the target well.
Q. Do you have that cross section?
A. I believe we have a cross section. I don't know if it's the same cross section.
Q. Do you have the cross section that you just referred to?
A. I think we do.
Q. Can I have that marked as an exhibit?
A. I think we do, somewhere in the papers.
Q. If you could identify it for us maybe we can get it marked.
A. Yes, sir.
MR. FELDEWERT: I appreciate that.

EXAMINER McMILLAN: I will tell you what, why don't we do it this way. Let's call a lunch and let's come back at 1:15.

MR. FELDEWERT: May I say one thing before we break for lunch? I actually want to make a motion.

In light of the testimony from Mr. Price, I would like to move to dismiss this application for two basic reasons: No. 1, clearly, proper notice has not been provided to all of the parties that could potentially be affected by this SW. That's clear. we have an improper notice.

And, No. 2, it seems to me -- and it is your decision -- but I fail to see how this can be a proper application for the Division when they did not provide the Division as required by the C-108 with any water samples from the interval, this being the Brushy Canyon, or even the Delaware, which is the formation that they are seeking to inject into. Instead they provide you with a water sample from the lower Bone Spring.

They also provide you with data in this application that is -- that hasn't been updated. Everything is over three years old.

Now you all tell us if that's sufficient for an injection well, because that's what they're saying to you. They come to you with an application that's over

three years old that they have not provided proper notice for, in which they did not provide you with a requirement, and that is a sampling of a bore from the injection zone in which they seek to inject.

So in my opinion, this case should be dismissed. And if they want to proceed here, they should come here with a proper application meeting all the requirements with the proper notice.

So I am moving to dismiss this matter.

EXAMINER McMILLAN: We will consider the motion and come back at 1:15 p.m.

MR. LARSON: At that time, I will have an opportunity to respond to the motion.

EXAMINER McMILLAN: Yes.

MR. LARSON: Thank you.

(Adjourned for lunch. Time noted 11:52 a.m.)

(After lunch, time noted 1:19 p.m.)

EXAMINER McMILLAN: I would like to call case No. 15322 back to order. And I believe we left it with the Key attorney offering a rebuttal.

MR. LARSON: That's correct, a response to Mr. Feldewert's motion to dismiss.

EXAMINER McMILLAN: Yes.

MR. LARSON: The first issue that he raised was a notice issue. Obviously, BC Operating and Crown

are on the same notice of the hearing. They are here today.

Mr. Price acknowledged in his direct testimony that there were some open notice issues. We had planned to request a continuance until August 20th to cure those issues, so that is not a basis to dismiss our application.

In terms of the application being based on 2012 data, unless there is something I don't know, I don't think the geology out there has changed in the last three years.

And in terms of the analysis of the formation water, the burden in one of these cases is for the applicant to show that the injected water is not incompatible with the formation. Mr. Feldewert has not cited a rule and I am not aware of one that requires an analysis of formation water as part of the SWD application.

And for those reasons, I would request that the motion to dismiss be denied.

EXAMINER WADE: So at this point, we are going to deny the motion to dismiss and continue on with the presentation.

CROSS EXAMINATION (cont'd)

BY MR. FELDEWERT:

Q. I think you had made mention of a cross section that you were relying upon with respect to the depth of the sediment or sands in your interpreted well reflected on Exhibit 10?

A. Yes, sir.

Q. Do you have that cross section?

A. Yes, sir.

Q. And have you marked it as an exhibit?

A. Exhibit 10-B.

Q. That works for me.

Have you prepared -- you don't have any kind of a isopach map?

A. No, we do not have that.

Q. Do you do any kind of analysis on that --

A. No. Not from a geologic perspective, we do not.

Q. From any perspective?

A. From the -- our attempt was -- our goal was to find correlative geology with nearby well log data which was complete, including resistivity, gamma, porosity logs, et cetera, to feed into the petrophysical model.

And the closest one we could find with a complete suite of wells was a well indicated on Exhibit 10, indicated in purple and green and identified as the interpreted well. It had the most complete data set for the evaluation.

Q. And that's the one that is down dip 36?

A. That is correct.

So we put the cross section together just to make sure that our geology was correlative and could be tied together as similar formation properties. It does show, Exhibit 10-B, it does show a slight down dip between the Grace Carlsbad Well, which is the second well from the left, and the Gulf Federal No. 4, which is the well we evaluated, which is the next well to the right or second well from the right.

Q. Let me ask you this, where is your line of cross section?

A. It would be on Exhibit 10, it goes from the left purple well, which is the Airport Grace No. 1 and API 20829. It goes due east to the Grace Carlsbad.

Q. And then down?

A. And then down to the Gulf Federal and then back up to the saver, Alan No. 1, API 20288.

Q. And I can't read that very well. Is that that purple looking well in the middle of section 31?

A. Yes, sir, that is correct.

Q. So, basically, if I understand you, to put it in the most simplest terms, if I'm looking at Exhibit 10, all the wells on here with the big circles, that corresponds to this?

A. That's correct.
Q. Now you mentioned that you're trying to do some correlative geology?
A. Yes, sir.
Q. Using well log data, they had a complete set of logs?
A. Using well log data that was available so we could tie similar log responses, such as gamma responses, resistivity responses, et cetera.
Q. Okay. Is there a reason you are aware from your Exhibit 10-A -- and if I look over in section 35, down at the southwest quarter, there's actually a producing oil well, correct?
A. Almost within the two-mile AOR. The only producer is well API 30379.
Q. Now have you examined that well?
A. Yes. That well is not producing into -- it's not producing from the Brushy Canyon according to the OCD record.
Q. Are you sure about that, because my records show it is producing from the Brushy Canyon?
A. Okay.
Q. And are you aware that that particular well does have a complete modern set of logs?
A. I don't know that answer.

Q. You didn't take that into account?
A. I don't know if we did or not.
Q. Do you know that that well produced 12,000 barrels of oil?
A. Off the top of my head, no, I don't. I don't know. I don't have the production history as an exhibit here with me. I know it was evaluated, but...
Q. So now if I'm understanding you, this interpreted well you've marked as Exhibit No. 10, now you have done some analysis using that well because you had a log there that was digitized, is that what I understand?
A. We ended up digitizing the log, yes.
Q. So you digitized --
A. We had to digitize, that's correct?
Q. So you're aware that you digitized the other logs and digitized them, right?
A. I'm sorry?
Q. You can take well logs and digitize them?
A. Yes, exactly.
Q. And there are public service companies that do that?
A. That's correct.
Q. And you have chosen to use just this well?
A. It had the most complete set of logs, and, I think, further testimony from the next witness will

describe that in a little more detail.

Q. What about the well directly to the west through the middle of section 36, what was the problem there?

A. It had logs but they were not complete logs.

Q. What were they missing?

A. I cannot answer that question but the next testifier can. It was either the well -- the log was partial at certain depths, like the Grace Carlsbad Well, for example, which is why we didn't use the Grace Carlsbad Well. It had partial log suite the entire length but the packages, the responses, were not continuous throughout.

Q. Wouldn't it have a log through the --

A. I'm sorry?

Q. Wouldn't it have -- it would penetrate --

A. It does, but it didn't have the logs required for the petrophysical masses.

Q. Okay. Did you undertake any effort to determine how the well that you did take, the interpreted well, how it corresponded to the prolific Carlsbad South Field to the north?

A. No, we did not.

Q. Did you undertake any effort to determine how -- what you've chosen as your interpreted well corresponds to that Oxy Airport Well in the southwest of section 35

shown as an oil well under Exhibit 10-A?

A. We did not.

Q. Now, I think you mentioned -- if I'm looking at Exhibit 10, up in the right-hand corner of this well that you highlighted, and you actually have some numbers there, correct?

So I am looking at section 31 on Exhibit 10 up in the northeast quarter; is that right?

A. Yes.

Q. And you have a bunch of numbers there?

A. Yes, sir.

Q. And you testified in your opinion that well is not economic?

A. That is correct based on this initial potential test.

Q. What was the basis for your economics? What did you use to make that determination?

A. The fact that the well wasn't developed and never went on line as a producer. The 14 barrels -- bear in mind, the 14 barrels, it's listed at four depths. That is a commingled initial potential test. So that's 14 barrels and 50 barrels of water across four perforated intervals.

So was there a single test performed, a single perforation in the Brushy Canyon? It's one of four. So

the 14 is a commingle from four different producing -- potentially producing intervals, and that was the result.

Did we run an economic analysis, an economic breakdown? We did not, no.

Q. That was my question. Thank you.

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

EXAMINATION BY EXAMINER McMILLAN

EXAMINER McMILLAN: The questions I have entail the well construction. Did you look at the well construction of the Grace Carlsbad?

THE WITNESS: Yes.

EXAMINER McMILLAN: Now, there appears to be an open section between 382 feet and 1,400 feet; is that correct?

THE WITNESS: If I can get to the schematic. What page on the exhibit?

EXAMINER McMILLAN: It would be --

THE WITNESS: I think I have it here.

EXAMINER McMILLAN: I'm looking at Exhibit 5, page ten.

THE WITNESS: Yes, sir. Okay.

EXAMINER McMILLAN: Now, what I'm concerned about on this is that there's -- part of the salt

section is exposed. And it has been my experience and I talked to a very well known operator, and he said that he's had 90 percent success rate when they've run casing through the salt. And he's had a 98 percent failure rate when they've cut the casing on the salt section.

And then I've also talked to people in the OCD. And they've done a sonar through those brine wells. And what's showing, the volume of salt on the sonar doesn't match the calculations. It's like, I believe, a million barrels of salt and the sonar showed like 3,000. With that in mind, they don't have a very good idea of where that salt cavity is.

Now what makes you think that the casing integrity won't be a problem on this well?

THE WITNESS: That's a good question, but I did not spend anytime in preparing for this testimony -- the focus of my testimony was on seeing if there's evidence to determine potential hydrocarbons.

I would have to think about that question. I don't think -- I don't think I'd be doing it justice if I answered off the cuff without considering it. That wasn't part of my investigation in the preparation of this hearing.

For instance, I would have to look at this compared to where the top and bottom of salt are

located. I don't know that just from this schematic.

EXAMINER McMILLAN: On the well files, they're showing salts at 600.

THE WITNESS: 600?

EXAMINER McMILLAN: Yes.

THE WITNESS: So top salt is at 600.

EXAMINER McMILLAN: Yes.

THE WITNESS: And then the underlying bed is where?

EXAMINER McMILLAN: Around 1,900, I believe.

THE WITNESS: So it's a 9-and-5/8ths casing through the salt; cemented to 500 feet up into the salt. Am I understanding the scenario correctly?

EXAMINER McMILLAN: I mean --

THE WITNESS: From the numbers you gave me, they were about 450 up in.

MR. LARSON: Okay. Can I interject at this point?

EXAMINER McMILLAN: Yes.

MR. LARSON: Mr. Price is prepared to answer your question.

EXAMINER McMILLAN: Okay.

MR. LARSON: I could call him back up when we are done with Mr. Pattee.

EXAMINER McMILLAN: Then we will do that quickly.

I don't have any further questions.

MR. LARSON: I have no redirect.

Should I call Mr. Price?

EXAMINER McMILLAN: Yes, bring him back.

MR. LARSON: One housekeeping matter. Can we get 10-A and 10-B admitted in the record?

EXAMINER McMILLAN: Okay.

MR. LARSON: I move the admission of Exhibits 10-A and 10-B.

EXAMINER McMILLAN: Exhibits 10-A and 10-B now may be accepted as part of the record.

MR. LARSON: Thank you.

(Key Energy Resources, LLC, Exhibits 10-A and 10-B were offered and admitted.)

WAYNE PRICE

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

EXAMINATION BY EXAMINER McMILLAN

THE WITNESS: I'm prepared to answer, Mr. Examiner. Do you want to ask the question again?

EXAMINER McMILLAN: I am concerned about the structural integrity of the well, because it looks like the 13-and-3/8ths was set to 382.

THE WITNESS: Right.

EXAMINER McMILLAN: And the salt is from 500 to 1680.

THE WITNESS: Something like that.

EXAMINER McMILLAN: And then the top of cement by temperature survey is 1451.

THE WITNESS: Okay.

EXAMINER McMILLAN: I am concerned about the structural integrity.

THE WITNESS: Of the well?

EXAMINER McMILLAN: Yes.

THE WITNESS: That particular well, which is currently P and A'd, and that well has been monitored for the last five years. And those reports have been sent into the environmental bureau chief. And those reports have not showed any indication whatsoever of any problems of any kind.

And it passed every mechanical integrity test that we ever had on that particular well. So that kind of answers your question.

EXAMINER McMILLAN: It does.

THE WITNESS: But I want to take -- I spent many years in the oil field chemical business, too. I want to take a little bit of exception to your philosophical view on how corrosive salt water and brine

water is. Concentrated brine water is not corrosive. It is a non-corrosive fluid.

Now it will scale very badly. Now if you get excess oxygen or if you have H2s in there -- and these brine wells do not have any H2s whatsoever. They do have some O-2 in them.

However, from that standpoint, these wells have never shown any corrosivity of any kind. And we've had those wells tested over and over and over.

And so just from that standpoint -- I understand that most people think if you throw salt on cement, it's going to degrade the cement; if you throw salt on a piece of pipe and it rains on it, it's going to corrode it. But concentrated brine water in itself is not a corrosive fluid. It's because of that saturation index that you get into -- and so I just want to throw that out for you.

This particular well is -- is actually -- I don't know if you know this or not, but we currently have an outstanding brine well permit in the same area. And that permit was approved by the OCD and it was also approved by the City of Carlsbad and went through a tremendous, tremendous, rigorous public notice and review.

And so that is a very, very safe area for

this to happen. And one of the reasons it is is that the Salado Formation, which is the normal salt formation in that area that most brine wells are completed in, this is in the Castile Formation.

And the Castile Formation has five different layers in it. And in those five different layers, there's three layers that are really thick and hydrate layers. And those layers actually help support any sort of instability of any well above that. And it would absolutely prevent any migration up or down.

And so I just want to throw that out at you, and this well has been studied extensively.

EXAMINER McMILLAN: Okay.

THE WITNESS: Particularly of the Carlsbad INW brine well situation.

EXAMINER McMILLAN: Okay. Any questions? Cross?

MR. FELDEWERT: No.

EXAMINER McMILLAN: Thank you very much.

THE WITNESS: Thank you, sir.

MR. LARSON: Next I would like to call Brian Davis.

BRIAN DAVIS

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

DIRECT EXAMINATION

BY MR. LARSON:

Q. Good afternoon, Mr. Davis. Would you please state your full name for the record.

A. Yes, Brian Davis.

Q. And where do you reside?

A. Houston, Texas.

Q. And by whom are you employed and in what capacity?

A. I am self-employed with Oil and Gas Evaluation and Consulting. It's a small consulting firm with four of us. It's located in Houston, Texas. And we've been in business for about twenty years.

Q. And what is the focus of your role as a consultant?

A. We are primarily a petrophysical interpretation company.

Q. And does your consulting firm have a business relationship with Longuist and Company?

A. We do indeed.

Q. And what's the nature of that relationship?

A. We have been doing consulting work for them for approximately ten years, since the founding of their company --

Q. Does your name appear on their website?

A. It actually does. They have me listed as their primary petrophysicist on the website.

Q. And have you previously testified at a Division hearing?

A. I have not.

Q. Have you served as an expert witness in litigation?

A. I have indeed.

Q. And in that litigation, did the court qualify you as an expert in petrophysics?

A. Yes, they did.

Q. And could you briefly describe your educational and professional background.

A. Yes. I graduated with a petroleum engineering degree from Texas A&M in 1988. So I went to work for Schlumberger Well Services on a wireline logging service truck.

I spend approximately with them, two years domestically, five years, international. I was an open hole and a case hole engineer, which means I did the completion as well as the drilling, logging part of the operations.

And after that, I moved to Houston and then started a consulting company with two of my other partners, one of which is now retired, but the other one

is still there.

Q. In terms of areas that you have focused on in your practice, what areas do those include?

A. Petrophysics, we generally tend to focus worldwide, so I have done -- I mean just about every country imaginable. I'm kind of working Tanzania. And I have also done a lot of work, of course, domestically in the U.S., done work in the Delaware Basin. So primarily just everywhere you find a well log, I have done some work there at some point in time -- well, just about.

Q. And are you familiar with the matters addressed in Key's application for injection authority?

A. I am.

MR. LARSON: Mr. Examiner, I move for Mr. Davis's qualification as an expert in petrophysics.

EXAMINER McMILLAN: Any objection?

MR. FELDEWERT: No objection.

EXAMINER McMILLAN: So accepted.

Q. Mr. Davis, I direct your attention to the document marked as Exhibit 11.

Could you identify that for the record?

A. Yes. This was my petrophysical methodology, just sort of giving the hearing body the ability to -- the Examiner Board the ability to see, in a nutshell, what I

did to evaluate the well.

Q. And did you prepare this document yourself?

A. I did indeed.

Q. And from your perspective, is it self-explanatory for somebody's who's a layman and doesn't understand it?

A. If you are not a petrophysicist, you may have a few questions.

Q. But it is self-explanatory --

A. If you hand it to another petrophysicist, he would understand what most of it is, what probably all of it is.

Q. I am going to ask you to identify the documents marked as Exhibits 12 and 13.

A. Yes.

Q. Could you identify those for the record?

A. That's -- the petrophysical summary is 12 and then 13, which is actually in multiple pages, but I think we put it in as one exhibit, which is the actual computer well log.

Q. And did you prepare all of these documents?

A. I did indeed.

Q. Comprised of Exhibits 12 and 13?

A. Yes.

Q. And from where did you derive the data that is included in your summary that's marked as Exhibit 12?

A. The data marked Exhibit 12 was primarily derived from the log in Exhibit 13.

Q. And what depths did you look at in the proposed injection interval?

A. I focused on the depths between 4,000 and 5,000 feet, which were our injection target.

Q. And did you look at specific subsections of that interval?

A. I looked at the whole interval. And then I evaluated the whole interval in an attempt to determine what the average porosities were, what the net reservoir rock was, different parameters that we use to determine if it makes a good injection well.

Q. After you determined those depths, what step did you take in your petrophysical analysis?

A. Well, what I did then is I took the original paper copy logs which we obtained from the OCD. And the reason we selected this well is that it was the closest proximity well that had a full suite of logs.

As the Examiner pointed out earlier, the Grace well actually did not have a porosity of shallow. So this was one the closest wells that we could find that would have a full suite of logs that will allow us to do it.

Q. Which well are you speaking of?

A. I'm speaking of the 32560 well, which is the Gulf Fed Com No. 4.

Q. Thank you. Just so our record is clear.

A. Sorry.

So that well we selected. We pulled the paper logs from the OCD website and we took those paper logs and we sent them out to a third-party and they digitized those logs; in other words, they got us back to a digital data that we could then run through our computer models.

Q. Referring back to Exhibit 12, what does the summary data that appears on this exhibit tell you?

A. It effectively tells us the total amount of reservoir quality sands that we pulled out of here and it also tells us the average porosity. And it also tells us the average water saturation in the well as well as an estimated permeability.

Q. And could you go into a little more detail adding to this?

A. Sure.

What each one effectively tells us, it will tell us how many feet of actually injectable interval we have, what the porosity is. And this is later used in additional modeling that moves into the reservoir engineering site.

But what it effectively told me is -- as we ran this and we got very high water saturations, the water saturation was calculating in the 95 percent range, which tells me we didn't see any appreciable hydrocarbons in the interval in this particular well.

Q. And in your opinion are there economically recoverable hydrocarbons in the Brushy Canyon in the location of the Grace Carlsbad No. 1?

A. Not according to this analogue well, no.

Q. And in your opinion will Key's injection of produced water in the Brushy Canyon present a threat to hydrocarbon production?

A. Not in this interval, no.

MR. LARSON: Mr. Examiner, I move the admission of Key Exhibits 11, 12, and 13.

EXAMINER McMILLAN: Any objection?

MR. FELDEWERT: No objection.

EXAMINER McMILLAN: Exhibits 11, 12, and 13 may now be accepted as part of the record.

(Key Energy Resources LLC Exhibits 11, 12 and 13 were offered and admitted.)

MR. LARSON: And I pass the witness.

CROSS EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Davis, just for the record and my

understanding if I look at Exhibit No. 10 --

A. Exhibit 10, yes, sir.

Q. And I am looking at that well in northwest six that is half purple and half green; do you see that?

A. Yes, sir.

Q. Your opinion is based on your interpretation of the information from that well?

A. Yes, sir.

Q. And based solely on that?

A. Yes, sir.

Q. You didn't do any correlation between that well and the Carlsbad South Field that produces from the Brushy Canyon?

A. I personally did not.

Q. And you didn't do any correlation between that well and the Oxy Airport Well that is located in the southwest of 35 and shown as an oil well on Exhibit No. 10?

A. Section 35, no. No, I did not go out that far.

MR. FELDEWERT: Those are all the questions I --

Q. Sorry. I have one more.

A. Okay.

Q. And this is a technical one.

A. Okay.

Q. If I look at Exhibit 11 --
A. Yes, sir.
Q. -- the stuff you said would be intuitive to a petrophysicist --
A. Yes, sir.
Q. -- and also to a geologist?
A. Some geologists, yes. Some geologists have a good understanding of petrophysics.
Q. The constant parameters you use, the second bullet point from the bottom --
A. Yes, sir.
Q. Do you see we got RW is .05?
A. Yes.
Q. What's that based on, what source?
A. That's based on what I determined to be a wet zone in the down dip structure well that I saw.
Q. And what was the source of that determination?
A. My experience looking at the well and determining that it's wet.
Q. That's based solely on your determination?
A. Yes.
Q. There's no --
A. I didn't have any water samples available.
Q. No water samples?
A. Right.

Q. And that's not based on any regional data?
A. No, not really.
Q. And not based on any published data source?
A. No.
MR. FELDEWERT: Those are all the questions I have.
EXAMINATION BY EXAMINER McMILLAN
EXAMINER McMILLAN: Did you incorporate any DST data?
THE WITNESS: There was no DST date on this particular well that I'm aware of -- in this interval, in this interval.
EXAMINER McMILLAN: But not in this area?
THE WITNESS: In this area, I mean I looked at the drill stem test map showing the offset wells, but we didn't have water samples or anything from those.
EXAMINER McMILLAN: Did you have any core data or anything?
THE WITNESS: No, there was no core data on this well either.
EXAMINER McMILLAN: And I think this question has already been asked. The Gulf Fed Well's down dip of the Grace Well, correct?
THE WITNESS: I believe that to be correct, yes.

EXAMINER McMILLAN: Have you looked at an analogue at all showing the relationship, the structural position of this well to another well to figure out the thickness of the oil column at all?

THE WITNESS: Well, I didn't see any oil column in this particular well so --

EXAMINER McMILLAN: I am saying in the analogues.

THE WITNESS: No, I did not look at any. Because we didn't -- I mean all these IP tests, they really didn't indicate there was any oil producers within the half-mile area of the salt water disposal well, which is really the area that we were looking into.

I know those other guys looked a little farther, but...

EXAMINER McMILLAN: I have no further questions. Any other questions?

(No response.)

EXAMINER McMILLAN: Thank you very much.

MR. LARSON: Last but not least. I call Mr. Gutierrez.

ALBERTO A. GUTIERREZ

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

DIRECT EXAMINATION

BY MR. LARSON:

Q. Good afternoon, Mr. Gutierrez, could you please state your full name for the record.

A. Alberto A. Gutierrez.

Q. And where do you reside, sir?

A. Albuquerque, New Mexico.

Q. And what is the name of your company?

A. Geolex Incorporated.

Q. And have you previously testified at the Division and Oil Conservation Commission hearings?

A. Yes, I have.

Q. And during those hearings, were you qualified as an expert in geology and hydrogeology?

A. Yes, I have.

Q. And do you have personal knowledge of the matters addressed in Key's application for injection authority?

A. I do.

MR. LARSON: Mr. Examiner, I move for Mr. Gutierrez's qualifications as an expert in geology and hydrogeology for purposes of today's hearing.

EXAMINER McMILLAN: Any objection?

MR. FELDEWERT: No objection.

Q. Mr. Gutierrez, you prepared and submitted a number of software disposal well applications, have you

not?

A. Yes, sir.

Q. And have a number of those or all of them been granted by the Division?

A. All except one, which when we withdrew and changed a zone it then got granted, yes, sir.

Q. So you are batting 100 percent?

A. Not quite but close.

EXAMINER McMILLAN: So he is accepted -- his credentials are accepted as a part of the record. Go ahead.

MR. LARSON: Oh, thank you.

Q. And in these numerous applications that you filed, do you always include sampling of formation water with the application?

A. No. Oftentimes it's not available. I mean so we derive our understanding of the compatibility of the formation fluid from just regional data, from experience with that zone and from a combination of whatever may be available at each individual site.

Q. And are you aware of any Division requirement that formation water analysis be included in an SWD application?

A. No. The SWD application in the section that talks about the geological information that should be

submitted includes -- it says a formation water sample if available. And then it says, if not available, you can use other regional data, published literature, et cetera.

Q. And are you aware of any requirement that an SWD operator have a lease for a pour space on an injection interval?

A. No.

Q. And I direct your attention to Key Exhibit No. 3.

A. Yes, sir, I have it.

Q. And I would like you to turn to page 41. Actually -- I am sorry -- turn to page 42.

A. Yes, sir.

Q. And what data appears on pages 42 through 49?

A. These are analyses from two water wells in the vicinity of -- fresh water wells in the vicinity of the subject well.

Q. And what do those -- and what do those data -- sorry, strike that.

What does the data indicated on these exhibits tell you about the presence and depth of water in the vicinity of the Grace Carlsbad No. 1?

A. In the vicinity of the Grace Carlsbad No. 1, there's basically two fresh water reservoirs, primarily the alluvial reservoir, which is thin and variable

through this area and certainly no more than a couple of hundred feet thick; and, then, there's the Capitan Reef, which is located further to the east of the -- sorry -- yes, further to the east of where the Grace Carlsbad Well is.

Q. And what is the date --

A. I'm sorry, the west. I'm sorry. I got confused.

Q. And what does the data tell you about the quality of the groundwater?

A. This water is actually pretty decent water. It has a total alkalinity of about 240 in one sample and a TDS of about 400. And then in the -- so it's good potable water in that alluvial zone.

Q. And I next direct your attention to page 21 of these --

A. Yes, sir.

Q. And what is the document that comprises pages 21 through 35 of Exhibit 2?

A. It's a report which was written by Dr. Dennis Powers that is an overview of the Delaware Mountain group and its characteristics, geologic and hydrogeologic characteristics.

Q. Does Dr. Powers focus on potential for produce water disposal intervals in the Delaware Mountain group?

A. Yes, he did.

Q. And which formation of the Delaware Mountain group did Dr. Powers deem to be the best candidate for a produce water disposal?

A. He selected several intervals within the Brushy Canyon Formation.

Q. And why did he select that particular formation?

A. I think he selected it for a number of reasons, which are discussed in his paper here, and that is he did an analysis, a general regional analysis of the geology of the Delaware Basin.

I know Dennis and he's experienced with this area, as am I. And he evaluated the -- basically the Delaware Mountain group down from the Bell Canyon all the way through the Brushy Canyon. And he found that the -- they had -- the data indicate from the Grace Carlsbad Well No. 1 logs that the Brushy Canyon in the intervals that are indicated as selected intervals between approximately 4,100 feet, roughly, and 5,200 feet, that those are the best potential intervals for injection, both in terms of sand quality, thickness, and continuity.

Q. And I'll next ask you to identify the documents marked as Key Exhibits 14, 15, and 16, to identify those documents.

A. There are three exhibits which I generated from

Dr. Powers' information. And they are exhibits that actually are similar to his 8-A and 8-B. But I just thought it was a little clearer to produce those in a way that they were separate exhibits, to show all the way from the base of the Castile Formation through the Bell Canyon as Exhibit 14, and then from the top of the Cherry Canyon or the base of the Bell Canyon to the base of the Cherry Canyon on Exhibit 15, and then the injection interval shown on Exhibit 16.

Q. And would it be fair to say you started with Dr. Powers work product and modified it to create these exhibits?

A. That is correct.

Q. And starting with Exhibit 14, which addresses the Bell Canyon, what is your interpretation of that formation in the area of the Grace Carlsbad No. 1 Well?

A. Well, it is a -- there is a -- the Bell Canyon Sand which is at the top of the Bell Canyon there. You can see that there are some zones that -- it's essentially a sand and silty sand combination of rock column throughout the Delaware, the top of the Delaware, that is marked very clearly by the Lamar limestone at the very top of the Bell Canyon. You see that pretty clearly on the logs. And it is marked there.

And then it continues down as a series of inner

bedded sands and shales through that zone to the top of the Cherry Canyon.

Q. And are you familiar with Dr. Powers' interpretation of the Bell Canyon?

A. Yes. And I am very familiar with the zone myself. I mean we just completed a well last week in the Cherry Canyon and Brushy Canyon at the extreme western end of Lea County.

Q. And does your interpretation of the Bell Canyon log differ at all from Dr. Powers'?

A. No, not really.

Q. Move on to Exhibit 15. And what is your interpretation of the Cherry Canyon as indicated on this log?

A. Similar. The Cherry Canyon is a fine-grained sandstone and shale unit that is -- got variable porosity and permeability throughout this section.

It's characterized on this gamma and acoustic log and the porosity log. You can see we got some pretty good porosity in some portions of it, but then some significantly lower porosity in other portions. But it is not as ideal of an injection interval as the Brushy Canyon shown on the next exhibit.

Q. Staying with Exhibit 15 for a moment, is there a barrier at the base of the Cherry Canyon that is

sufficient to prevent the migration of produced water injected into the Brushy Canyon?

A. There are numerous barriers throughout the Cherry Canyon that would prevent migration. And the zones themselves within the Brushy Canyon that have been selected are fairly area-wise extensive and there would not be a tendency to go out of that zone based on my experience with that.

And I did some additional work -- and we can get to it -- that more carefully lays out where those barriers are in the subsequent exhibits.

Q. And moving on to Exhibit 16, could you please describe your interpretation of geologic characteristics of the Brushy Canyon in this area.

A. Yes. I think the Brushy Canyon is a fine-grained sandstone. It is a -- it has some intervals throughout that 1,000-foot section that constitutes the Brushy Canyon that are preferable in terms of their injectability. And some of those zones are the zones that have been indicated in red as the zones that will be perforated in the injection interval.

Q. In his study, did Dr. Powers make a conclusion regarding whether there are producible hydrocarbons in the Brushy Canyon?

A. He did a general analysis of the Delaware

Mountain group. Yes, he did. And he came to the same conclusion that I came to when I reviewed the data. And that is that it is not likely to be a productive zone.

Q. And then I am going to ask you to identify a range of exhibits here, starting with 17 and ending with 23. Could you identify each of those, please?

A. Yes. These are some exhibits that I prepared to just look at the general geologic conditions and the wells in the vicinity of the Grace Well that we have proposed be used as a saltwater well, and to look at a correlation section with some of the adjacent Bone Springs well, and then to look more specifically at what were the zones that contained -- predominantly lower permeability and porosity zones that would serve as the injection cap rock and bottom rock for the injection interval.

And that's what these exhibits are. I can go through each one if you would like.

Q. We'll address them individually. And did you create each of those exhibits, Exhibits 17 through 23?

A. Yes, I did.

Q. Let's go to the first on Exhibit 17. What are you attempting to depict with this map?

A. I am just showing what the general wells are in the area and the wells that are some Bone Spring

producers as well as Delaware producers.

The closest active Delaware producer to the SDW is a little more than a mile away. And there are some others that are producing two to three miles to the west.

Q. Do you know what formation the active Delaware producer is producing from?

A. We didn't go and look at each one of these individual wells. But a lot of these wells produce out of the Bell Canyon Sand. Some may also produce out of portions of the Cherry Canyon and Brushy Canyon.

Q. And that statement is based on your experience in the area?

A. Yes, that is correct.

Q. Moving on to Exhibit 18.

A. Yes. This is just a shrunk down version of the well that is the subject well here, showing the zones that are relatively impermeable both above and below the Delaware in this area.

And it also indicates some areas where there has been active Delaware oil wells in the area. And some of them do, in part, correspond to the injection interval as you can see down there at the bottom of the Brushy Canyon. However, those are significantly outside of the area of review of this well.

Q. And does this log give you any indication of whether injection into the Brushy Canyon would impact these Bone Spring producing wells that are indicated in your log?

A. Yes. If we turn to Exhibit 20, you can see that we -- the vertical distance between the base of the proposed injection interval and the top of the first Bone Spring pay is a little over 1,100 feet. And it's separated by a number of moderate to thickly bedded carbonates that are -- and clastics that are relatively impermeable. So I don't believe that there is going to be any effect from the injection into the Brushy Canyon lower zones outside of the Brushy Canyon.

Q. And focusing now on Exhibit 19, what does this sonic log section tell you about the proposed injection unit?

A. It shows that you've got a zone throughout the Brushy Canyon that indicates that there are some areas, you know, have varying porosity, but that especially in the lower three quarters of that zone, we have some decent sands. And some of those sands are the ones that have been selected for perforation in this well.

But you get basically an inner bedding of very tight zones, as you can see in the very top of the Brushy Canyon there, with some better zones down toward

the base.

Q. And you referred to Exhibit 20 a moment ago in terms of the distance between the top of the First Bone Spring and the injection interval. Is there anything else you want to derive from your Exhibit No. 20?

A. No, I think that's it. It was just to demonstrate that.

Q. Moving on to Exhibit 21.

A. Yes. This is an exhibit that shows that, you know, the lower half of the Cherry Canyon, that it is really devoid of clean porous sand. There is about 400 feet of tight kind of fine grain clastics that you can see between the top of the proposed injection zone and the first clean sand, and then we've got some additional type clastic rocks above.

So I believe that there is sufficient contrast in the permeability and porosity of those zones to keep the injection in zone in the Brushy Canyon.

Q. And moving on to Exhibit 22. What is this diagram intended to tell us about the geologic conditions in upper Cherry Canyon and the Bell Canyon?

A. Well, as you can see, it's not until you get to the very upper Cherry Canyon and then into the Bell Canyon that you get more clean and porous sand.

And that is capped typically throughout this area

by the very tight Lamar limestone which separates it from the Castile Formation.

And then in the Castile, which is shown on Exhibit 23, you've got 1,400 feet of alternating and hydrate and salt, which was mentioned by Wayne in his testimony, that that is also a significant barrier to upward flow.

Q. And now I'm going to refer you all the way back to Exhibit 3 again.

A. Okay.

Q. Specifically pages 50 to 58.

MR. FELDEWERT: Exhibit 3?

MR. LARSON: Yes.

MR. FELDEWERT: The field application?

MR. LARSON: Yes.

MR. FELDEWERT: Okay.

Q. Let's start on 51 and we have a page range that goes on to -- I am focusing on the Cardinal Laboratories' analysis.

A. Yes.

Q. Page 51 through 60.

A. Yes.

Q. From where did -- these lab samples that Cardinal analyzed, where was that water taken from?

A. Based on my understanding from talking to

Mr. Price as well as from the Cardinal lab chain of custody forms, one sample was taken from what is referred to as the P Water Tank and the other is the P Water Bone Springs.

And these are analyses that are representative of the type of fluid that is going to be injected into that zone if this application is approved. And one is more indicative of the Bone Springs, and one is a mixture of waters that includes produced waters from various zones within the Delaware.

Q. And would you identify the document marked as Key Exhibit 24, identify it for the record.

A. Yes. Let me just -- if I could finish on this Cardinal exhibit.

Q. Sure.

A. I just want to point out when you look at the composition of the water in both of these, which is not unusual in my 30 years of experience in southeast New Mexico, the formation water is not substantively different between these two. Now, clearly one is kind of a mix of a variety of waters.

But if you take a look at the TVS and the conductivity and the chloride, they are all brine waters that are quite -- while their trace elements may be somewhat different, the general characteristics of the

water are fairly similar.

Q. And based on that testimony and your experience, do you believe there would be any issue of incompatibility between the injected water and the formation?

A. I haven't seen any data to indicate that. And like I said, not just from relying on this information in this area, but I have experience with the Cherry Canyon and Brushy Canyon all the way from the Capitan Reef all the way well into Texas. And I haven't seen any problem with this zone in terms of compatibility of injected fluid with these types of fluids.

Q. And anything else you would like to discuss regarding these Cardinal lab data?

A. No. I think that's pretty representative of what it's for.

Q. And I'll ask you now to focus on Key Energy Exhibit 24. Can you identify it for the record?

A. Key Energy Exhibit 24 is an order R-13889, an order of the Division regarding a salt water disposal well in Lea County, New Mexico.

Q. And in that order, how did the Division deal with Yates Petroleum's argument that your requested injection fully should be denied because the injection would impair Yates's drilling program for depths below the

injection interval?

A. Well, in page 4 of 7 of the order, number 6, it is fairly straightforward there. It says that the -- that the -- one of the things that Yates requested was that they contended that it would increase their costs and increase the difficulty of accessing lower zones by having to drill through the zone and therefore impairing their correlative rights.

And the Division concludes in their discussion that basically if -- the impairment or potential impairment of correlative rights only relates to the drowning by water of any stratum and it does not extend to formations that are not the target of the targeted hydrocarbon of reservoirs or pools.

Q. In summing up your analysis of the proposed injection interval, is it your opinion that there is a barrier at the top of the Brushy Canyon that will effectively prevent any migration of produced water into the Cherry Canyon?

A. Yes. And below into the Bone Spring.

Q. Are there any faults or other hydrologic connections between the Brushy Canyon and sources of protectable groundwater?

A. Within the area of review, I haven't seen any based on my analysis of the log data.

Q. In your opinion would the proposed injection present a threat to protectable groundwater?

A. Not at all. I think it is well isolated. While the Hearing Examiner brought up some excellent points about the concerns of the casing integrity, if the program similar to the one that was approved in the previous order is followed in the completion or recompletion of this well, then it should be protective of groundwater in that area.

Q. And in your opinion will Key's proposed injection present a threat to hydrocarbon production?

A. No. It is my opinion that there are not economically producible hydrocarbons in the Brushy Canyon in the area that is proposed for injection. I think the petrophysical analysis, which I've also reviewed, is indicative of that.

And my experience in general in the area is that that zone is generally not productive of hydrocarbons certainly within the area of review that we are dealing with here.

MR. LARSON: Mr. Examiner, I move the admission of Key Exhibits 14 through 24.

EXAMINER McMILLAN: Objections?

MR. FELDEWERT: No objection.

EXAMINER McMILLAN: Exhibits 14 through 24

may now be accepted as part of the record.

(Key Energy Resources Exhibits 14 through 24 were offered and admitted.)

MR. LARSON: And I will pass the witness.

CROSS EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Gutierrez, let's kind of go backwards here. I want to go to Exhibit 24.

A. Yes, sir.

Q. This was based upon an argument that the -- it would somehow affect the ability to produce hydrocarbons below the injection formation, correct?

A. That is correct.

Q. It has nothing to do with whether there's hydrocarbons that exist in the Brushy Canyon which is the formation that you are seeking to inject into --

A. This order does not -- what I was seeking to discuss here was the fact that the Division typically limits their analysis to the injection zone itself.

Q. And that is what I want to focus on here, because our argument here, of course, as you probably know sitting here, is that we believe the Brushy Canyon is productive. With that in mind, Exhibit 22, does that have anything to do with the productivity of the Brushy Canyon?

A. No.
Q. If I go to Exhibit 22, does that have anything to do with respect to the question of whether the Brushy Canyon is potentially productive of hydrocarbons?
A. No.
Q. Same question with respect to Exhibit 21, which as I read it deals with the lower half of the Cherry Canyon.
A. That is correct. No.
Q. Same question with respect to Exhibit 20.
A. Well, Exhibit 20 is dealing with the separation between the Bone Springs and the Brushy Canyon. So, no, it does not have to do with the Brushy Canyon.
Q. And the same thing now with Exhibit 19, does this have anything to do with whether the Brushy Canyon in this area is potentially productive?
A. Well, this particular log does not. The one that I showed earlier, which was an adaptation from -- Dr. Powers shows a variety of other log traces and based on my analysis of these logs and based on the petrophysical, I don't think that there's an indication that there is production in that zone.
Q. I want to get to that in a minute. With respect then to Exhibit 17.
A. No, not at all -- actually. Exhibit 17 does.

Q. Let me ask -- I have a different question. I think you're right; I think it does have an impact.

First off, I think we need to make a correction. Don't you have the proposed SWD improperly marked on here; isn't it in the east half of 36?

A. No. 1, Airport, that is not the -- that is not the Grace Carlsbad Well. It is not intended to mark the Grace Carlsbad.

Q. It is not intended to mark the proposed SWD?

A. No, you are exactly correct; it is incorrectly marked there.

Q. If I look on here, the one thing you do identify in green are the Delaware producing wells; is that correct?

A. That's correct. And plugged wells.

Q. Okay. And all of the wells that you show here marked in green are Delaware producing wells?

A. Well, some of them are producing wells in the Delaware and some are -- there is one that is an injection well, and there are others that are plugged.

Q. Let me stop you right there. If I go up to your legend up there in the upper left-hand corner --

A. Yes, sir.

Q. Green circles mean Delaware producing zones?

A. Producing zones, yes. It doesn't mean it is a

producing well.

Q. I understand. A Delaware producing zone is marked in green on that map, correct?

A. Yes, sir.

Q. If I take a look at -- and I think you testified -- correct me if I am wrong -- you testified that most of this production is from the Cherry Canyon or the Bell Canyon; is that your testimony?

A. No. I said that a lot of the Delaware production in the area is from the Bell Canyon.

Q. Okay, thank you.

A. Yes, sir.

Q. Staying with Exhibit No. 17 and I want to go -- start in section 36.

A. Yes, sir.

Q. And I want to go directly west and I want to go to the first green dot.

A. Yes, sir.

Q. Did you examine to determine where that Delaware was producing?

A. No, I did not.

Q. Would it surprise you to know that that's the Brushy Canyon?

A. No, it could well be.

Q. If I then go just to the southwest of that green

dot in section 35, in section 3, the next closest Delaware producing well, would that surprise you that that is in the Brushy Canyon?

A. No.

Q. Did you examine to see if it was in the Brushy Canyon?

A. No, because it is well outside the area of review of the well.

Q. And then if I go to the wells that show up here to the north of section 36, that series of wells in section 24, do you see that?

A. Yes, I do.

Q. Are you familiar with that field?

A. I am generally familiar with it. I didn't look at it again in detail here because it's outside of the area of review of the well.

Q. Is that the Carlsbad South Field?

A. I'm not certain.

Q. You are not aware then that that field produces from the Brushy Canyon?

A. Well, my indication is that we've got a couple of gas producers shown there, one oil producer and six plugged wells.

Q. But you are not aware that that field was productive in the Brushy Canyon?

A. No, I've heard that testimony earlier here today, and I don't dispute that.

Q. And then if I go to that large grouping of dots to the left at section 36 over there in 33 and 32 --

A. Yes, sir.

Q. -- are you aware of that field?

A. You mean the ones that are approximately four miles to the west of our subject well?

Q. The Happy Valley Field.

A. I don't know if it is the Happy Valley Field or not.

Q. Great name.

A. Yes.

Q. Did you examine where that field was -- what zones that field was producing from?

A. No, sir, because they're well outside the area of review of this well.

Q. You said that based on your opinion and despite these wells that we just walked through -- you said based on your opinion that there is no way that the Brushy Canyon under the east half of section 36 is going to be productive; is that your opinion?

A. That is my opinion.

Q. And that is based on petrophysical analysis?

A. It's based on the petrophysical analysis --

Q. It's based on a petrophysical analysis and it is based upon a single well that is shown on Exhibit 10, correct?

A. Right. That I believe is representative of the Brushy Canyon there.

Q. And then you said it is based on your general experience?

A. And I have extensive experience with the Brushy Canyon and Cherry Canyon in Lea and eastern Eddy County.

Q. So it doesn't surprise you then having gone to these wells that there are wells that are producing from the Brushy Canyon interval?

A. That is correct.

Q. Is your opinion then based on anything else?

A. It is based on my review of Mr. Powers' discussion of the geology of the area.

Q. I thought you said --

MR. LARSON: Would you let him finish his answer, please.

MR. FELDEWERT: I'm sorry.

Q. Go ahead.

A. It's based on that. It is based on my review of the cross sections that were presented earlier here today, which to me indicate that the well that was selected for the petrophysical evaluation is

representative of the Brushy Canyon in this area.

Q. Let me stop you right there. Are you talking about what has been marked as Exhibit 10-B?

A. No. I think the petrophysical evaluation was Exhibit 11, I thought.

Q. I --

A. You mean the cross section? Is that what you're referring to?

Q. I am referring to whatever you were referring to.

A. I referred to several things. One was the petrophysical analysis of that well.

Q. And then you talked about your general experience --

A. Right.

Q. And then you mentioned Mr. Powers' report, and I want to get to that.

A. Right.

Q. And then you mentioned something else, some cross section.

A. Yes. The cross section here.

Q. Which exhibit is that?

A. 10-B.

MR. LARSON: Is 10-B the one you were referring to earlier?

MR. FELDEWERT: That is what I said earlier.

Q. And would you agree with me that what is shown on Exhibit 10-B, that we don't really have a full suite of logs here? In fact, some of them are kind of hard to read, do you agree with that?

A. I mean, I don't know what you mean by we don't have a full suite of logs. We have logs that allow you to correlate the injection zone across these wells from the Bold Energy, the Oxy, Grace Carlsbad No. 1, and -- which is the subject well, and the Cimarex well and the Sabre well further to the east.

Q. Can you calculate from this the SW water saturation?

A. No.

Q. And then you mentioned Mr. Powers' report?

A. Yes.

Q. Can you point to me anywhere in Mr. Powers' report where he comes to the conclusion that the Brushy Canyon interval in the east half of section 36 is not potentially productive?

A. Well, there are several places. One is by the very fact that his ultimate recommendation is that intervals one through four of the Brushy Canyon are the most suitable intervals for injection of salt water, which in my mind presupposes that that would not be impacting hydrocarbons.

Q. Let me step back. He doesn't make that statement. He just points out that those zones because of the porosity are potentially useful for a salt water disposal well, correct?

A. No. I think you have to take the report in its entirety. If you look at the paragraph in the upper left of that one, the one that starts with the Brushy Canyon --

Q. Let's get to a page. What page are you on?

A. Sorry. Page number 9 of his report, which is page 32 of the application.

Q. Okay.

A. He has a paragraph where he discusses one of the issues or potential issues which is what potential connection there is from the Brushy Canyon to potable water zones. And that is one of the reasons that he -- that the lack of that connection with the Capitan Reef which was one of the reasons why he thought that those were the best sections.

Q. I agree. I am just looking for any statement that indicates his conclusion that the Brushy Canyon is not potentially productive, that you say exists.

A. He says, There's some potential for conflict with resources in these formations, but they appear to be avoidable.

And he describes the production from the Brushy Canyon south of the proposed location. And he says, That production may require some additional examination -- which I think Longuist as Steve testified -- we've looked at IP's from that area and there just does not seem to be a significant potential for production. That's my opinion.

Q. I understand your opinion. I'm just trying to understand what aspect of the Power report in your mind seemed to indicate that he believes the Brushy Canyon is not productive in the east half of 36. And I think you just took us to, on page 9, a section that is entitled Resource Conflicts; is that correct?

A. Yes, sir, that's correct.

Q. And so the Examiners like you can read that and draw their own conclusions?

A. That's correct.

Q. Anything else in this report?

A. I would say the report in its entirety. I think it's a very good characterization of the geology of the Brushy Canyon -- well, in general of the whole Delaware Mountain group in that area.

And that combined with my experience in that zone and in fact what I thought were overly conservative assumptions in the petrophysical analysis of a residual

water saturation of only 30 percent, where in my experience, the residual water in the Brushy Canyon tends to be a lot closer to 35 to 40 percent or greater in places.

So based on his discussion, based on my own personal experience with the Brushy Canyon and the Cherry Canyon, I believe that this is supportive of my opinion.

Q. I want you now to look at Exhibit 5. Were you, Mr. Gutierrez, involved in preparation of this application?

A. No, sir, I was not.

Q. So you did not direct the work?

A. No, sir.

Q. And as I understand it, based on your statements that you made here today, isn't it a fair statement that there is Brushy Canyon Formation water that someone could ascertain and is available in the area?

A. I don't know that. I mean, I would assume if you've got oil production that has produced water with it from the Brushy Canyon, you could take a sample of that.

Q. We just saw some wells that we went through in your Exhibit 17 that are producing from the Brushy Canyon.

A. But I don't know what water they produce or whether they are zones that are mixed within the Delaware group or whether they're only Brushy Canyon. I do not know.

Q. So did you look to ascertain whether there are samples of Brushy Canyon water available that could have been utilized for this report?

A. I did not.

Q. And looking then on page 3 of this application --

A. Yes, sir.

Q. And looking at section 7, okay?

A. Yes.

Q. And looking at paragraphs 4 and 5.

A. Yes.

Q. I understand your opinion to be in reading that language that an applicant is not required to present to the division for compatibility analysis water from the receiving formation if it is available; is that your opinion?

A. My opinion is that -- just exactly what it reads there, it says, Attach a chemical analysis of disposal zone formation water. And it says, May be measured or inferred from existing literature, studies, nearby wells, et cetera.

And that's what I have done in my analysis of

the Brushy Canyon. Now I didn't prepare the application, so I don't know to what extent Dr. Powers did or did not look at other data.

Q. So it is your opinion as an expert in this and in reading this language that as an applicant you don't have to provide the Division for comparison water from the receiving formation even though it is available?

A. That's correct. Because as a matter of fact, in many applications that I have prepared myself and provided to the Division, it is sufficient to have an understanding of what the waters and the formation itself, more importantly, and what its potential compatibility issues are with injected fluid.

So almost always we provide an analysis of the injected fluid. But I would say in probably 60, 70 percent of the applications I've prepared, there is no specific analysis of the water in the receiving formation.

Q. And then somewhere somebody along the lines said you present for the analysis water not from the receiving formation but from the Bone Spring Formation, correct?

A. No, because that is water that is representative of the injected fluid, the fluid that's going to be injected.

Q. Wasn't that the water that's representative of the receding formation, the Brushy Canyon here? What was presented to the Division? Having read this report, is it representative of the water in the receiving formation, that being the Brushy Canyon?

A. Other than what was presented in Mr. Powers' general geologic discussion of the Delaware Mountain, there was no specific formation water analysis presented to the Division.

Q. And as a result, if I look at the Cardinal Laboratories analysis, there was no Cardinal Laboratories analysis of the water in receiving formation, correct?

A. Well, in the P Water Tank -- my understanding and it was the testimony provided earlier today -- that that contained Delaware Mountain water.

Whether it contains water from the Brushy Canyon or what portion of that, I do not know.

Q. And you are talking about the water that was tested three years ago from the produced water tank?

A. That's right.

Q. If I look at the Cardinal Laboratory report beginning on page 50 of Exhibit 5 --

A. I think it's 51.

Q. Start on page 50 just to get us oriented. This

is their report, correct?

A. I'm sorry but mine starts on page 51. It starts with a cover letter from Cardinal Laboratories.

Q. I am looking at page 50, it says one of ten on Exhibit 5.

A. I'm sorry. I am looking at Exhibit 3. My mistake.

Q. Go to five and then we are all on the same page.

A. It is on page 50 of Exhibit 5, yes, sir.

Q. Having prepared these before, this is submitted for purposes of addressing the requirements in paragraph 7 of the C-108.

A. Yes.

Q. That said, if I go to the second page, it shows that they took an analysis of a -- it's just described as a P Water Tank?

A. Yes.

Q. And that is what you are referring to?

A. Yes.

Q. And then it says that they took an analysis of the P Water of the Bone Spring; do you see that?

A. Yes.

Q. That would be the Bone Spring Formation?

A. Yes, sir.

Q. Can you tell from where they took this analysis

of the water in the Bone Spring Formation?
A. No.
Q. You can't tell anywhere in your report, correct?
A. No.
MR. FELDEWERT: That's all the questions I have.
EXAMINER McMILLAN: I don't have any questions.
EXAMINER WADE: Redirect?
MR. LARSON: I have no redirect. In fact, I am finished with my direct case and I reserve the right to call a rebuttal witness if necessary.
EXAMINER McMILLAN: We are going to take a break and start back at five till three.
(Brief recess.)
EXAMINER McMILLAN: I would now like to call back in order case No. 15322.
MR. FELDEWERT: I have two witnesses. I believe they still need to be sworn.
EXAMINER McMILLAN: Let them please be sworn in.
(WHEREUPON, the presenting witnesses were administered the oath.)
CALEB HOPSON
having first been duly sworn, was examined and testified

as follows:

DIRECT EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Hopson, would you please state your full name, identify by whom you're employed and in what capacity.

A. Yes, sir. My name is Caleb Hopson. I'm employed by BC Operating as a landman. I have been employed for one year and three months at BC Operating.

Q. Prior to that, did you work for Concho?

A. I worked for Concho Resources for three and a half years prior to that as a landman.

Q. Did your responsibilities include the Permian Basin of New Mexico?

A. The Permian Basin and Delaware Basin of New Mexico.

Q. What's the relationship between BC Operating and one of the parties that objected here and Crown Oil Partners V?

A. BC Operating is the operating entity on behalf of Crown Oil Partners V, LP.

Q. And does one of these entities hold an oil and gas lease covering the east half of section 36?

A. Yes. Crown Oil Partners V, LP, owns the oil and gas lease on the east half of 36.

Q. When did they obtain the state lease?
A. March of 2014.
Q. Am I correct that the state lease number is VO-9614?
A. Yes.
Q. It covers the east half?
A. The east half of 36.
Q. It covers all depths?
A. All depths.
Q. As the state lessee, does the company have current plans to develop the state minerals under section 36?
A. Absolutely.
Q. If I turn to what has been marked as Crown Exhibit 1 -- BC Operating Exhibit 1.
A. Yes.
Q. Is that an approved APD for a vertical well?
A. Yes, sir, it is.
Q. And if I look at the second page, we will see that it would be located in the southwest quarter of the southwest quarter, which is unit E?
A. It is the southeast quarter of the southeast quarter, yes, sir.
Q. And is this well to be initially drilled to the Wolfcamp?

A. It will be.
Q. And your drilling it at an oil well location?
A. We are, yes, sir.
Q. Has this been approved?
A. It has been approved pending a nonstandard location administrative approval.
Q. Then turn to what has been marked as BC Operating Exhibit 2.
A. Yes, sir.
Q. Is this an approved APD for a horizontal well in the Wolfcamp Formation in the west half of the east half of section 36?
A. It is.
Q. And, again, is this to be -- is the completed interval for this well to be located at an oil well location?
A. Yes, sir.
Q. Now, if I look at what has been marked as BC Operating Exhibit 3 --
EXAMINER McMILLAN: Before you go any further, we need to approve --
EXAMINER WADE: Will this witness be --
MR. FELDEWERT: He's not offering any opinions.
EXAMINER WADE: It's going to be fact.

Q. If I turn to what's been marked as BC Operating Exhibit No. 3, is this a stratigraphic -- what is this called --

A. A stratigraphic column across the platform shelf in the Delaware Basin in southeastern New Mexico.

Q. And the point of this, does it identify for the record the location of the Wolfcamp in relationship to the Bone Spring Formation and then the Delaware Mountain Group?

A. It sure does.

Q. Wolfcamp being in the lower zone?

A. Yes, sir.

Q. Does the company have funds budgeted to examine the Delaware Formation through using these well bores?

A. Yes, sir.

Q. And does the company intend to run a full suite of logs on through the Delaware utilizing these well bores?

A. Absolutely.

Q. And what overall is the development plan for the company for the east half of section 36; how is it going about developing this section?

A. Development for the east half of 36 will most likely start with the Airport 36 State No. 1 Well, the vertical test well, as a Wolfcamp vertical test well.

We will run the full suite of logs, evaluate the Brushy Canyon and, the Delaware Formation. And at a later date in time, come up hole behind pipe and test these zones as well.

That is scheduled for some time in the fourth quarter of 2015. Pending results of that well, the second quarter of 2016, we plan to drill the horizontal Wolfcamp Well, Airport 36 State No. 2H and run the same full set suite of logs and evaluate the Delaware at that time as well.

Q. And for economic purposes and as a prudent operator, is it generally customary to start with deeper formation and then move up in terms of your development?

A. It is.

Q. Based on your position with the company as a landman -- let me ask you, did Crown acquire these state leases in part because it believes the Delaware in this area is prospective?

A. We do.

Q. Does that include the Brushy Canyon?

A. It does.

Q. And the company has funds to analyze and explore the Delaware including the Brushy Canyon?

A. We do.

Q. And does the company intend to call a geologist

to show why the Brushy Canyon is productive?

A. Yes, sir.

MR. FELDEWERT: I move the admission of BC Operating Exhibits 1, 2 and 3.

MR. LARSON: No objection.

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

(BC Operating Exhibits 1, 2, and 3 were offered and admitted.)

MR. FELDEWERT: And that concludes my examination of this witness.

CROSS EXAMINATION

BY MR. LARSON:

Q. Mr. Hopson, how did Crown acquire the state lease, was it at auction?

A. At a public auction, yes, sir.

Q. And has that lease been filed of public record in the county?

A. It has not been filed of public record because it is not necessary to file it in the public record.

Q. Has it been filed in the state land office records?

A. It has.

Q. When was it filed?

A. I do not know that answer.

MR. LARSON: That is all I have.
EXAMINER McMILLAN: I have no questions.
MR. FELDEWERT: Call our next witness.
EXAMINER McMILLAN: Please proceed.

MICHAEL MOYLETT

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

DIRECT EXAMINATION

BY MR. FELDEWERT:

Q. Please state your name and identify by whom you are employed and in what capacity?

A. My name is Michael Moylett and I work for BC Operating, Inc., and I am senior geologist.

Q. And how long have you been with the company?

A. Three years. And prior to that 27 years, 30 years, in the Permian Basin stationed in Midland, Texas.

Q. So you have 30 years of experience in the Permian Basin --

A. Yes.

Q. Does that include -- and does your experience include examining the Delaware Formation?

A. Yes.

Q. Have you previously testified before the Division?

A. Yes, I have.
Q. And were your credentials as an expert in petroleum geology accepted and made a matter of public record?
A. Yes, sir.
Q. And are you familiar with the application filed by Key in this case?
A. Yes.
Q. And have you conducted a geologic study of the formation or I should say the interval that is the subject of their SWD application?
A. Yes.
MR. FELDEWERT: I once again tender Mr. Moylett as an expert witness in petroleum geology.
EXAMINER McMILLAN: Any objections?
MR. LARSON: No objection.
EXAMINER McMILLAN: So accepted.
Q. Mr. Moylett, have you examined the interval that Key seeks to utilize to inject produced water?
A. Yes.
Q. And what depth is that in what zone?
A. It is in the lower Brushy Canyon at approximately 4,082 feet to approximately 5,100 feet.
Q. And that lower depth, 5,100, is that roughly the base of the Brushy Canyon?

A. Yes.

Q. In your opinion, is the Brushy Canyon interval underlying your proposed injection well in section 36 productive of hydrocarbons?

A. Yes.

Q. And if I then take a look at -- let me step back. And have you prepared a number of exhibits to demonstrate that?

A. Yes.

Q. Generally would you give us an overview as to what those exhibits show?

A. The exhibits I'm showing would be a production map, showing where the Grace Carlsbad Well acreage is; and also showing the production in the Delaware in the Brushy Canyon or Cherry Canyon in relationship to the Grace Carlsbad Well.

Basically, there is production from the Brushy Canyon and Cherry Canyon in the immediate vicinity, and those productive sands correlate to the sands in the Grace Carlsbad No 1 Well.

So I have a production map. I have a structure map that shows that we are on strike to the Happy Valley south field; to the north it made 442,000 barrels from nine wells. It also shows that we're structurally up dip for some 5,000 barrel show wells in the Cherry

Canyon.

And it also shows that we're up dip from the -- that well in section 6, the one well they use for the petrophysical analysis for the evaluation. And I have a structure map -- excuse me -- a Bone Spring gross isopach that shows the center of the submarine channel fans and that we are in -- the Grace Carlsbad Well is located in an intersection of two adjoining submarine fan complexes.

Q. Is that a Bone Spring or a Delaware?

A. Sorry, Brushy Canyon. I might have said Bone Spring. It is Brushy Canyon.

Q. Now you mentioned the well that they use for a petrophysical model?

A. Yes.

Q. And you testified to demonstrate that that is actually down dip of the section 36?

A. Yes, it is down dip to the Grace Carlsbad Well.

Q. Can we also hear testimony with respect to the exhibits associated with that petrophysical analysis?

A. Yes. On the petrophysical analysis, they used an RW of 0.05.

Q. Let me stop you right there. I want to get to an exhibit. Are you referring to Exhibit 11?

A. Yes.

Q. Did you look at this?
A. Yes, I have.
Q. What problems do you see with Exhibit 11?
A. The parameters that were used in the petrophysical analysis to determine that that -- that there -- that the well in section 6 was calculated unproductive.
Q. And what are the problems that you see?
A. Well, they used an RW of 0.05. There are drill stem tests in the area. When you convert the drill stem test water recovery, it's two bottom hole temperatures, it's closer to 0.035.
Q. Let me stop you right there.
So that is based on actual data and that is someone's interpretation of what they think it should be?
A. No. Drill stem tests --
Q. Drill stem tests. And also instead of being .05 it's .035?
A. Yes.
Q. What impact does that have on their conclusion?
A. It would lower the water saturation using a .035 versus .05.
Q. Okay. What other observations did you see?
A. For the Archie's Equation, for the M and N

factors, which is a cementation in tortuosity, factors, I used two, which is actually more common for a carbonate versus a sandstone.

M and N factor should be generally 1.8 in sandstones of this quality. They mention they had quality sands in the Brushy Canyon. So 1.8 would actually also lower the water saturation calculations versus using a 2 in the Archie's Equation.

Q. And you would use 1.8 in what environment?

A. In sandstones.

Q. And does that exist in the Brushy Canyon --

A. Yes.

Q. -- underlying section 36?

A. Yes.

Q. Okay. All right.

I want to go to your exhibits. If I then turn to what has been marked as BC Operating Exhibit No. 4, would you please explain to the Examiners what is shown on this map, what all the colors mean, and orient us as to where section 36 is located on this particular exhibit.

A. The brown circles as noted in the title block are just the Delaware producers that fall under the 453-DLWR New Mexico field pool. So this is all a production in the Delaware 453. It does not state whether it is

Brushy Canyon or Cherry Canyon or Bell Canyon.

I went through each well and I looked at the logs and I looked at the perforation intervals and determined whether it was Cherry Canyon, which is marked CYCN, or Brushy Canyon, which is marked BYCN on there.

I've also stated that the cumulative production, the oil production in the Carlsbad South Field to the north, 442,000 barrels from nine wells; Happy Valley Field, directly to the west, 1.5 million barrels; one to the southwest turned in 86,000 barrels.

And there's down dip Cherry Canyon wells, approximately 5,000 barrels in section 30 and 31. One is still active.

Q. Now --

A. And also the well in section 35, the Oxy Airport No. 1, it's also in the Brushy Canyon, and it has produced 12,000 barrels of oil.

Q. So I take it from your analysis, for the record, that the oil numbers are in green and the gas are in red and water are in blue?

A. Yes.

Q. And just to further identify where we are on this map, if I look at section 36, do you have the east half crosshatched there for the Examiner?

A. In all the maps that I'm going to share, that

would be our state lease there. And then the two permitted wells, the horizontal well and the vertical well are noted in red circles there.

Q. Okay. And, essentially, you are going to take now this map showing the Delaware producers in the area and utilize it to show a structure?

A. Yes.

Q. And then the gross isopach?

A. Yes.

Q. Is there anything more about this map?

A. No.

Q. I do have one question. You mentioned the productivity of the Carlsbad South Field to the north.

A. Yes.

Q. A very productive field?

A. Yes.

Q. Okay. And with respect to the Happy Valley Field to the west, was that a successful field?

A. Yes, very economic.

Q. And then you mentioned that Brushy Canyon well in the southwest -- is it the southwest of 35?

A. Yes.

Q. A productive well?

A. Yes, in the Brushy Canyon.

Q. All right. Then let's take -- go again to what

has been marked as BC Operating Exhibit No. 5 and as you mentioned you left the producers on there, correct, and overlaid a structure map?

A. Yes.

Q. And tell us how this structure map was developed and what it shows.

A. I used the tops provided and I also quality control checked them. But GDS was a service that got bought by HS and they went through all the logs in the Permian Basin and picked some of the tops up in there.

But you will see from the previous cross section that Brushy Canyon, Cherry Canyon are very easily recognizable tops.

So what I have shown here is a structure map on top of Brushy Canyon. The contour interval is 1 inch to 100 feet. And the Grace Carlsbad Well is structurally up dip from the -- about 50 up dip from the petrophysical well they used in section 6.

But we are actually on strike to the prolific Carlsbad South Field to the north. We are structurally flat to that field.

Q. And looking at --

A. And up dip from those show wells -- not show wells but 5,000 barrel wells in section 30 and 31 from the Cherry Canyon.

Q. So focusing on what you say is the field that is on strike with the east half of section 36, if I look at that field, is it roughly similar in size to --

A. Yes. The 320 acres of section 36 could hold the exact same amount of wells that produced the 442,000 barrels if productive from the Carlsbad South Field.

Q. And then you mentioned that you are moving up dip as you move to the west?

A. Yes.

Q. Now why is that important?

A. Because oil migrates up dip.

Q. So based on your opinion, is the east half of section 36 in a structurally favorable position to produce oil?

A. Yes, it is.

Q. And based on your opinion, is that east half of section 36 on strike with the productive field to the north in section 24?

A. Yes, the Carlsbad South Field is...

Q. And you mentioned you did a gross isopach map for the Examiner.

A. Yes.

Q. Then turn to what has been marked as BC Operating Exhibit No. 6. Does this take the same map showing the

productive wells and overlay a gross isopach map?

A. Yes.

Q. What do you see with respect to the deposition and thickness in the east half of section 36 and how it relates to other areas?

A. These are Brushy Canyon gross isopach maps, contour interval of 50 feet. What I have highlighted in the black there are the depositional centers of the submarine fans you have up there in the -- to the northeast and also the center part; you have two submarine fans that coalesce and meet in that Grace Carlsbad section, and then proceed to the south.

And then you have a different fan over there out into the west for the Happy Valley, Cherry and Brushy Canyon. But it shows that the Grace Carlsbad Well is in the intersection of two submarine fans. It should have -- it does have thick Brushy Canyon sand similar to, you know, the fields that produce on strike to the Carlsbad South Field, roughly 1,500 to 1,550 feet, a gross section.

Q. Is this roughly the same channel as the field to the north?

A. Yes.

Q. So you mentioned that you are structurally in a great spot from the east half of section 36. What about

stratigraphically?

A. Yes, similar.

Q. For guys like me, would this be the sweet spot --

A. Yes.

Q. -- for the Brushy Canyon?

A. Yes.

Q. Now, have you -- unlike prior witnesses, did you attempt to correlate the Brushy Canyon zone in the east half of section 36 with the producing zones?

A. Yes, I have a cross section shown at the sand that produces in the Carlsbad South Field, is present in the Grace Carlsbad Well. And another sand, the Oxy Airport Sand is also present in the Grace Carlsbad Well.

Q. And that's that well that you show producing on this map in the southwest and southwest of 85?

A. Yes.

Q. All right. If I turn to what has been marked as BC Operating Exhibit No. 6. Is this an old-fashioned, large cross section map?

A. Yes. There's a lot of detail on it because it is hard to see the date on a small scale --

Q. I would like the Examiners to pull this out. Okay. First to orient everyone, if I look in the bottom left-hand corner of Exhibit No. 7, does that identify the wells that you utilized for your cross section?

A. Yes. It shows the line of cross section running from north, northeast to south, southwest; four wells on the cross section, Grace Carlsbad Well being the third well on the cross section.

Q. The Grace Carlsbad Well being in section 36?

A. Yes.

Q. And did you have good logs to do this work?

A. Yes, I did.

Q. And then on this map did you identify for the Examiner the tops of the Cherry Canyon, Brushy Canyon, and Bone Spring?

A. Yes. And there are some internal correlations also. You can see that the dips are consistent, for the most part, from the Cherry Canyon to the Brushy Canyon to the Bone Spring lime.

So there is no appreciable amount of thickening or thinning in this cross section for the Cherry and Brushy Canyon sands.

Q. So, actually, I'm glad -- one thing I neglected to ask you. You mentioned that you had correlated it with that Oxy Airport well. And that is actually the first well on the left -- sorry -- to the right --

A. Sorry. It's on the right.

Q. Okay. All right. And then also you had the well on the left in the productive area in the north?

A. In the Carlsbad South Field, yes.

Q. Now, did you also identify for the Examiner the proposed injection interval since you utilized the Grace -- .

A. Yes, it is noted on the left part of the well bore in the Grace Carlsbad Well for approximately 4,100 feet to 5,200 feet.

Q. And what do the green boxes represent that you see?

A. The green boxes are the productive sands in the offset wells that were produced in those specific well bores.

And I have noted -- if you start on the well to the Endurance Resources Baseball Park No. 2 from the Carlsbad South Field, what I showed in that little cross area was the date completed. For example, this well was completed in May of 1985, the potential for 40 barrels of oil, 40 barrels of water, 250 barrels -- 1,000 cubic feet of gas a day.

250 barrels of water a day; was plugged and abandoned in September of '13 but it made 82,000 barrels of water, 42 million cubic feet of gas and 760,000 barrels of water.

And then below that is just a stimulation, the perf interval and the sand frac, that was 60,000 gallons

and 180,000 pounds of sand. So 82,000 barrels.

Q. And then as you move across this cross section, there is a lot of data on here, but what do you observe with respect to the Brushy Canyon and, in particular, the interval that they seek to perforate for injection?

A. On the Grace Carlsbad Well from approximately 4,200 feet 4,300 feet, that resistivity is similar to the resistivity in the Carlsbad South Well and those sands are correlative on that resistivity log in the Grace Carlsbad Well over to the Endurance Resources Well.

You see the base of the sand at 4,300 feet in Grace Carlsbad Well, and 4,300 feet in the Endurance Well. There's a high resistivity streak in the base of that sand. And on top of the sand, in the Grace Carlsbad Well, around 4,190 feet; and 4,190 feet in the Endurance Well there's another resistivity marker.

So there's two high resistivity markers that bookmark that sand above and below. So there is the correlation on that productive sand in the Grace Carlsbad Well South Well and in the Carlsbad South Field, and the Endurance Resources Baseball Park No. 2 Well. So they're injecting -- proposed and actually produces in the offset wells.

Q. So if I look at your exhibits here, you already

mentioned that in your opinion the east half of section 36 is on strike with the highly productive area to the north?

A. Yes. It's on strike with the Endurance Resources Baseball Park No. 2 Well that produce 82,000 barrels of oil.

Q. And with respect to the sediments, does it correlate to that highly productive area to the north?

A. Yes.

Q. Same depositional sediments, same productive channels?

A. Yes.

Q. In your opinion, does the available data demonstrate that the Brushy Canyon underlying section 36 is going to be productive?

A. Yes.

Q. And based on your opinion, will Key Energy's proposed injection interval actually inject into a productive zone underlying section 36?

A. Yes.

Q. And will that result in the waste of state minerals?

A. Yes.

Q. Okay.

A. And they are also injecting in the bottom of the

Brushy Canyon Sand that produces in the Oxy Airport 35 No. 1 that we talked about in the southwest of southwest 35.

If you look at the Oxy Airport 35 No. 1, the same nomenclature there, green is where they produced -- they perforated the well from 5,038 feet to 5,054 feet -- that well produced 12,000 barrels of oil, 34 million cubic feet of gas, 103,000 barrels of oil, still making two barrels of oil a day.

And there at the base of the Brushy Canyon, right on top of the Bone Spring lime, and if you look at the sand from 5,100 feet to 5,200 in the Grace Carlsbad Well, it is the same sand that is present in the Oxy Airport 35 No. 1 from 5,020 feet to 5,100 feet.

Q. I want you to put that aside. And I would like you to go to what was --

MR. FELDEWERT: May I approach the witness?

EXAMINER McMILLAN: Yes.

Q. Mr. Moylett, I have handed you what has been marked as Key Energy's Exhibit No. 5, which is a C-108 application.

A. Yes.

Q. And I have done that because I want you to turn to page 21 of that particular exhibit.

A. Yes.

EXAMINER WADE: Is that Exhibit 5?

THE WITNESS: Yes.

Q. And this is the same report that I reviewed with Dr. Gutierrez?

A. Yes.

Q. Now this was prepared by Dennis Powers back in March of 2012?

A. Yes.

Q. He is a geologist?

A. Yes.

Q. You are a geologist?

A. Yes.

Q. Did you review this report?

A. Yes, I have.

Q. In your opinion, did it discuss the potential for waste if this SWD is approved?

A. Yes.

Q. And if I turn to page 1 of that report which is page 22 --

A. Page 22, yes.

Q. If I just look at page 1 on page 22 of this exhibit, and I then go to the right-hand column and then go to the second full paragraph, it states that some zones at the top of Cherry Canyon and Basal Brushy Canyon are producing in the general area around the

perspective site, correct?

A. Yes.

Q. And that is your observation as well, right?

A. Yes.

Q. And if I turn to page nine, which I think is a provision that Dr. Gutierrez might have referenced.

A. Page 9 of the report, page 32 of Exhibit 5.

Q. Thank you. Under the heading Resource Conflicts?

A. Yes.

Q. Did you read this as a geologist?

A. Yes, I did.

Q. And what conclusion did you draw having reviewed what Mr. Powers put in here about the resource conflicts?

A. Mr. Powers when -- everyone read it already since you already presented it once. He cannot state 100 percent that the Brushy Canyon is not productive in the Grace Carlsbad Well. He cannot say for 100 percent sure that it's not productive.

Q. And doesn't he say that there's potential conflict?

A. Yes, he does.

Q. If I then go to actually his words here, he references Broaden Heads adjustment?

A. Yes, they are New Mexico state geologists.

Q. He states that they describe production from the Lower Brushy Canyon Sandstones. That's what we're talking about here, right?

A. Yes.

Q. South of the proposed location?

A. Where our wells are permitted, yes.

Q. That's my next question. You got permitted wells south as far as you can get on your release?

A. Yes.

Q. In section 36, correct?

A. Yes.

Q. And then he goes on to state that this production, he is referencing the production that they saw south of this area, of section 36, may require additional examination to determine if there is conflict with some of the preferred --

A. Yes.

Q. Isn't that what you all are doing?

A. Yes. We proposed to run a mud log, modern suite of logs, and some sidewall cores into the Brushy Canyon to determine the commerciality of it on the Grace Carlsbad lease.

Q. In your opinion, based on the information that that you put together here, is the east half of section 36 productive in the Brushy Canyon Formation?

A. Yes.
Q. Is that why the company in part leased it?
A. Yes.
Q. And they put their money where their mouth is and you're going to study the zones?
A. Yes.
Q. And in your opinion would -- if a salt water disposal well is now permitted to inject into the state minerals underlying section 36 in the Brushy Canyon is that going to prevent you from producing those?
A. Yes.
Q. And in your opinion, will the granting of this application cause the waste of oil and gas that is owned by the state of New Mexico for the benefit of its citizens?
A. Yes.
Q. Were BC Operating Exhibits 4 through 8 prepared by you or compiled under your direction and supervision?
A. Yes.
MR. FELDEWERT: I would move the admission into evidence of BC Operating Exhibits 4 through 8. Exhibit 8 is actually another copy of this Powers report.
EXAMINER McMILLAN: Any objections?
MR. LARSON: No objection.

EXAMINER McMILLAN: Exhibits 4 through 8 may now be accepted as part of the record.

(BC Operating, Inc., Exhibits 4 through 8 were offered and admitted.)

MR. FELDEWERT: And then just to tighten things up, you'll note, Mr. Examiner, that Exhibit 9 is the change of operator form that I think they previously referenced, a change of operator form that they previously referenced in a brief --

MR. LARSON: It's an exhibit.

MR. FELDEWERT: Okay. And then Exhibit No. 10 is the formal notice of violation that was referenced earlier during Mr. Price's testimony that comes out of the business records. So to complete the package, I move the admission of Exhibits 9 and 10 as well.

MR. McMILLAN: Exhibits 9 and 10 may now be accepted as part of the record.

(BC Operating, Inc., Exhibits 9 and 10 were offered and admitted.)

MR. FELDEWERT: And that concludes my examination of this witness.

EXAMINER McMILLAN: Cross-examination.

CROSS EXAMINATION

BY MR. LARSON:

Q. Did BC perform a petrophysical evaluation in the Brushy Canyon within the area of review?

A. Correlating the resistivity logs I have, it has shown that the productive Brushy Canyon zones look similar on a resistivity log. In the Grace Carlsbad log, the offset producers to the Great Carlsbad Well only had a resistivity log, did not have a neutron density log, a sonic log or a gamma ray over it.

Q. And as a geologist, do you refer to that as a petrophysical examination?

A. Yes.

Q. Do you have a petrophysicist on staff?

A. No, we don't.

Q. Did you ask a petroleum engineer to look at it?

A. Yes.

Q. And what did that person tell you?

A. We just looked at the correlations and he said it warrants further examination.

Q. I refer you to Exhibit 5. And I believe that larger cluster in section 32 and 33 are called the Happy Valley.

A. Yes.

Q. Are you a Cowboys fan?

A. Sometimes.

Q. What's the correlation between that cluster of

producing wells and the Grace Carlsbad Well?

A. Well, it produces in a brushy canyon in a field. It is actually in a different submarine fan channel in there. But it is structurally, you know -- and it's stratigraphically in a different field, but it shows that the Brushy Canyon does produce in another field in the area up in there.

Q. And what's the difference in elevation from the Happy Valley group of wells in the Grace Carlsbad?

A. 300 feet structurally.

Q. Up dip or down?

A. It is up dip but it's in a different submarine fan. It is in a different complex.

Q. Keeping on Exhibit 5, moving on up into sections 19 and 24, what is the correlation between that cluster of wells and the Grace Carlsbad?

A. I am looking for 19 and 24 --

Q. Just north --

A. I see section 19 and I see -- oh, 24, I'm sorry, the Carlsbad south field. Yeah, they are in very much the same submarine fan and they're structurally on strike to them or structurally flat.

Q. Are they structurally on trend with Grace Carlsbad?

A. Yes.

If you look at the structure map in between the -- the contours of minus 445 and minus 550 is where the Carlsbad south field is located and the Grace Carlsbad Well is in between minus 450 and minus 550.

Q. Could that cluster of wells there in sections 19 and 24 be considered an independent structure?

A. No. It doesn't close over the entire field. If you go back to the cross section, the Endurance Resources Baseball Park No. 2 is actually a little structurally lower than the Grace Carlsbad Well.

Q. I apologize. I can't read this fine print. But the well you just referred to, there are two wells directly above that?

A. Yes.

Q. How does that elevation correlate to the Grace Carlsbad?

A. The ones that have the little circles around them show -- it could be structurally higher by a little bit. It's -- actually, it is minus 550, so it's similar.

Q. It could be -- could it be interpreted to be structurally higher?

A. Two of the wells can. Not the well that made the 82,000 barrels.

Q. And you were discussing Key Exhibit 11, which is Mr. Davis's methodology?

A. Yes.

Q. And you referred to the RW Factor. And if I understood your testimony correctly, you disagreed with his use of 0.05 and believe that 0.035 was a better number to use?

A. Generally, out in the Delaware Basin, yes. The water saturation calculation has to be taken with a grain of salt in the Delaware, because they all calculate very high water saturations. So you can't generally run a water saturation calculation on a well and say that's wet because everything else around it is going to be wet. Like I say, an endurance well made 82,000 barrels and it calculates a high water saturation calculation also.

Q. And you may have said this and I missed it; what was the water calculation on that?

A. I did not bring that with me. But the oil cut was around ten percent, so it's going to have a high water saturation calculation.

Q. And I believe Mr. Hopson testified that BC Operating has budgeted funds to develop these wells down at the Wolfcamp?

A. Yes.

Q. And if there's a belief that the Brushy is productive, why weren't the wells tested in the Brushy?

A. They haven't been drilled yet. They are permits.
Q. I understand they haven't been drilled yet. But my understanding from his testimony was the first target was the Wolfcamp?
A. Yes.
Q. Why didn't you target the Brushy?
A. Because we like to start with the deepest producing horizon in the area that appears economic and work our way up hole or beyond pipe. But at the same time, we're also going to run a modern suite of logs of the mud log and sidewall course also. But, see, like Mr. Powers' report says, down to the south that of course you could be productive.
MR. LARSON: I apologize I am searching for an exhibit, and they have gotten out of order on me.
(Pause.)
That is all I have, Mr. Examiner.
EXAMINER McMILLAN: Okay.
EXAMINATION BY EXAMINER McMILLAN
EXAMINER McMILLAN: I want clarification on your -- how you got an RW.
THE WITNESS: I cannot provide the specific well, but there's a -- the water resistivity book was published by Schlumberger. And I looked in the area, and around that township there was a well that had

drilled some tests in the Brushy Canyon.

But it is always more accurate if you actually have a true water sample.

EXAMINER McMILLAN: So you got it from a publication?

THE WITNESS: Yes, a publication.

EXAMINER McMILLAN: The next question is where are you going to run the sidewall course? I mean I realize this is a proposed well, but are you going to shoot it through the Brushy, the Cherry, the Bone Springs?

THE WITNESS: I want to evaluate the Delaware, because the Bone Spring has been established to produce, for the most part, in the entire area. That's why -- it's been a resource play right now. They're drilling horizontal wells.

The Delaware and the Cherry Canyon I propose to run the sidewall cores in, you know, based on the evidence that it's productive and the wells are down dip to us from thirty, thirty-one in Cherry Canyon and Brushy Canyon is, you know, productive also in the immediate vicinity.

EXAMINER McMILLAN: I don't think I have -- by the way, did any bulk volume water take place?

THE WITNESS: No, I had not. I couldn't do

it on the Grace Carlsbad Well because I only had the resistivity log on it.

But I have not done any bulk volume water saturations. But that's the purpose, we can run that when we run the pod hole logs in our permanent wells.

EXAMINER McMILLAN: Okay. I have no further questions.

MR. FELDEWERT: That concludes our presentation.

MR. LARSON: Mr. Examiner, can I bear your indulgence for a couple of minutes to talk to my witnesses about possible rebuttal testimony?

EXAMINER McMILLAN: Sure.

(Pause.)

MR. LARSON: I first call Mr. Gutierrez.

EXAMINER McMILLAN: What I would like to know is whether or not BC Operating will supply how they got their RW, because the discrepancy in the deal appears to be the RW calculations.

Will you be willing to supply where you got it?

MR. MOYLETT: Yes, I will.

EXAMINER McMILLAN: And will you be willing to supply it to Key?

MR. MOYLETT: I'll tell you where the well

is from.

EXAMINER McMILLAN: I want the --

(Mr. Feldewert conferring with Mr. Moylett.)

EXAMINER McMILLAN: The basis is I say it's the RW.

MR. LARSON: I am going to call Mr. Davis up on rebuttal to address that issue.

EXAMINER McMILLAN: Okay.

MR. LARSON: I don't know that that answers your question of Mr. Feldewert.

EXAMINER WADE: So what is the final answer as to whether that number is to be provided?

MR. FELDEWERT: If the Examiner would like to see that number, we can get that number --

EXAMINER WADE: Okay. So I'm not sure that you need your witnesses at this point.

MR. MOYLETT: It's an SPN publication and I'll supply the data to all --

MR. FELDEWERT: He will give it to me and I'll distribute it.

EXAMINER McMILLAN: That's great. Please proceed.

KEY ENERGY RESOURCES LLC REBUTTAL

ALBERTO A. GUTIERREZ

having been previously sworn, was further examined and

further testified as follows:

DIRECT EXAMINATION

BY MR. LARSON:

Q. Mr. Gutierrez, I am going to have to stand over your shoulder because I don't have that exhibit. You have in front of you BC Operating Exhibit 5.

A. Yes.

Q. And looking at this cluster of wells just to the north of the Grace Carlsbad in section 24, what is your interpretation of that structure there?

A. I would say, as BC Operating's witness described, the wells are generally on strike. And I emphasize "generally."

There is clear evidence on this very structure map -- which is, by the way -- has primary contours of 100 feet of structure. And it shows that there is a structure right in the east half of section 24 that is high relative to this section 36.

And so I don't find it unusual that you would have six oil wells on that particular high and then none further to the south. So I don't think that just because there is production on this structural high in the same fan, that that indicates that section 36 is productive.

And, in fact, when you look at the wells going to

the east and south there that are now plugged, those wells produce very little oil. One produced 3,900 barrels; one, 5,200 barrels; and one, 4,500 barrels.

Furthermore, the well that was mentioned to the west in section 35, that well is also on a structural high within -- between the 350 and 450 contour. I would assume that's the 400 contour. And it's a structural high right around that well.

And, furthermore, the wells in Happy Valley, as the witness testified, they're 300 feet up dip and a completely different fan section.

So I think that the production that is in the south Carlsbad field is associated with a local structure in that area and is not indicative of broad production potential two miles further to the south.

Q. Any other comments on that exhibit?

A. No.

MR. LARSON: That's all I have.

MR. FELDEWERT: I don't have any questions.

EXAMINER McMILLAN: Next witness.

BRIAN D. DAVIS

having been previously sworn, was further examined and further testified as follows:

DIRECT EXAMINATION

BY MR. LARSON:

Q. In your experience as a petrophysicist, have you encountered problems or do you see problems with using a drill stem sample?

A. Yes. If the geologist said it actually came from a drill stem test, the drill stem test, as you guys are aware of, is actually fluid that's flowed back up through the pipe usually during a drilling test.

Well, that is not going to be a true RW that is coming back up the pipe. You are going to have mud filtrate mixed in the sample, possibly mud. So you're going to have -- it's not going to be a true RW, unless you flowed 100 percent of all your fluids back and cleaned up the well for a substantial time.

So I am a little leery of using drill stem test RW type data, if that is indeed -- that's what I understood him to say where it came from.

Q. And the Hearing Examiner raised an issue about an RW and anticipated the question I was going to ask you. What is the difference between a 0.05 RW and a 0.035 as suggested by BC's geologist?

A. All right. If you just took the basic model that I ran -- and my .05 showed that the thousand-foot interval was effectively 100 percent, 95 percent wet.

If I run that same interval on a .035, I now have

introduced about another 12 to 13 percent of water saturation, which means I brought that interval down to around 82 percent.

So now I've got 18 percent oil saturation over 1,000 feet plus 1,500 feet above, which has similar log characteristics. I've got a 25-foot hundred oil column with almost 20 percent oil saturation. I have probably hit one of the larger discoveries in New Mexico in years. Even if I get a ten percent water cut out of that, I am doing pretty darn good. I don't know about you guys, but we aught to run to the courthouse and start leasing because it's huge numbers, if we go to a .0350 RW.

MR. LARSON: That's all I have.

CROSS-EXAMINATION

BY MR. FELDEWERT

Q. Mr. Davis, in preparation for this case here today, did you go out and get a true RW?

A. I got one from what I thought was a wet zone in the well, yes.

Q. I thought that 0.05 was based on your analysis?

A. Based on what I thought was wet in the well.

Q. It is not an analysis itself, was it?

A. No, it's not.

MR. FELDEWERT: That is all I have.

EXAMINER McMILLAN: I have no further questions.

STEPHEN L. PATTEE

having been previously sworn, was further examined and further testified as follows:

DIRECT EXAMINATION

BY MR. LARSON:

Q. Do you have a couple of rebuttal exhibits?

A. I do. I have three.

Q. Mr. Pattee, could you identify the document that's been hand marked as Exhibit No. 25?

A. Yes, sir. When we did our evaluation of the immediate area surrounding the Grace Carlsbad Well, we started with a half mile, as I previously discussed, per OCD statutory area review requirements. We expanded it out to try to gather as much information as we could to get the best picture painted in and around section 36.

To ensure that we -- that the influence of this injection well fell within those areas of review, we performed a plume migration model. Now what we did was from the petrophysical evaluation of the target sands for injection, that is porosity cutoffs of nine percent or greater, it was identified that there is 644 feet within the 1,000 foot target interval of sands greater than nine percent calculated. Of that 640 feet, going

on the assumption that the typical perforated injection well for economic considerations in the completion of the well typically produce or perforate 150 to maybe 250 of pay, of reservoir, we took a model of 150 feet. We assumed that Key would perforate the bottom 150 feet of sands greater than nine percent porosity. And we ran an injection model to see how far out over a twenty-year period that that injected water would influence on the reservoir.

And that number came out. According to this Exhibit 25, you will see the range of the plume is 1,043 feet. So in the influence of the Grace Carlsbad injection at a typically expected completion interval, over a 20-year period of injection, would radiate a field approximately 1,000 feet away from the well bore.

Coupling that with a petrophysical analysis of a well approximately 2,500 feet away, the correlation of influence on this well to the potential for productive hydrocarbon indicates this well is not -- this is not going to influence or have any bearing on the production that's identified in the structure maps, two, three, four miles away. The influence is minimized.

If they perforate the full 644 feet of net reservoir porosity greater than 9 percent, Exhibit 26 shows that the plume after 20 years of constant

injection would only migrate out 500 feet.

So the well is not influencing the reservoir on a grand scheme. And, furthermore, the petrophysical analysis of the immediately surrounding area of influence and area of investigation indicates that there's hydrocarbons of noncommercial quantity in that area; therefore, it's a nonproductive zone at the location of this well.

The third point, Exhibit 27, we expanded that -- and I think Exhibit 10A was a two-mile producing interval. This is the producing interval chart of all the wells within a two-mile radius of the Grace Carlsbad Well. And there was only one well that fell within the injection interval that has a history of production. And that was a well to the very north, and it was almost two miles away.

The well indicated on this -- on this chart, Well No. 6 is the well that was referred to as producing to the west. And it's just below our proposed injection interval.

So a two-mile review, historically only one well pops in, allow for the well to the west -- which produced 80,000 barrels -- two wells pop in. They are nearly two miles away. And our area of influence is going to be approximately 1,000 feet.

The impact of this well, in our opinion, should not affect hydrocarbon production in this zone.

EXAMINER McMILLAN: All right. Cross?

CROSS-EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Pattee, why don't you look at Exhibit No. 4 in our packet.

A. Yes, sir.

Q. Why don't you look at what's been hash tagged in section 36.

A. Yes, sir.

Q. You see the two red dots?

A. The two red dots to the south?

Q. Yes.

A. Yes, sir.

Q. And then you see the symbol that I believe relates to the Grace SWD just to the north of that?

A. Yes.

Q. What is the distance between that and the red dot?

A. Roughly 1,000 feet.

Q. Okay. You are not stating -- are you? -- that this SWD is not going to have an impact on the ability of the lessee to produce hydrocarbons in the Brushy Canyon zone in the east half of section 36, are you?

A. Considering -- looking at Exhibit 4, considering the well that we evaluated for hydrocarbon -- for petrophysical analysis is in section 6, northwest corner, between the permitted well in question and the Grace Carlsbad Well, the indications are --

Q. I am talking about the injection. If you inject into the Brushy Canyon and you saw water at your proposed maximum rates, your testimony is it's not going to have any impact on the ability of the state lessee under intersection 36 to produce from the Brushy Canyon?

A. If there are no hydrocarbons to produce, yes, that's what I am saying.

Q. But if there are hydrocarbons to produce, it will have impact, correct?

A. If there were, yes.

Q. Thank you.

MR. FELDEWERT: That's all I have.

EXAMINER McMILLAN: I really have no further questions at this time. Closing.

MR. LARSON: I would move the admission of Exhibits 26, 27 and 28 -- excuse me -- 25, 26, and 27.

EXAMINER McMILLAN: Exhibits 25 through 27 may now be accepted as part of the record.

(Key Energy Resources LLC Exhibits 25 through 27 were offered and admitted.)

MR. LARSON: Mr. Examiner, I believe that our witnesses have carried their burden of establishing that Key Energy can safely inject produced water into the proposed interval, and I would request a continuance of this case until August 20th so Key can address the outstanding notice issue.

MR. FELDEWERT: We move to dismiss, we move to dismiss this application. I think we've also demonstrated that the area is potentially productive of hydrocarbons.

We are dealing with state minerals held in trust for citizens of the state of New Mexico. So if you are going to get an SWD here, you better be very, very comfortable that there's no hydrocarbons there. And I don't see how you get there with this record.

And we have a lessee that's there. We have a lessee that's going to develop this acreage. And what they're suggesting is that an SWD that's going to prevent from developing hydrocarbons in the Brushy Canyon that they believe exists and I think we've demonstrated exists in this area. So we ask that this be denied. And I don't think you need to come back for any notice.

EXAMINER WADE: At this point, we are going to deny the motion to dismiss and we can set it for the

future.

Specific to the notice, I did not see a return card for the state land office. And among all the other parties that you said you found out, please make sure that you do notice the state land office and we will get proof of that notice.

MR. LARSON: I believe Mr. Price testified that they did receive it, but we will investigate that, sir.

EXAMINER WADE: There might be a concern, even though I'm not sure, as to who received that notice at the state land office.

MR. LARSON: We will look into that.

EXAMINER McMILLAN: And also BC will be expected to provide the requested information to the parties.

MR. FELDEWERT: Yes.

EXAMINER McMILLAN: With that in mind, case No. 15322 will be continued.

MR. LARSON: Thank you.

MR. FELDEWERT: Thank you. And the date?

EXAMINER McMILLAN: To August the 20th.

(Time noted 4:15 p.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, July 23, 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
NM Certified Court Reporter No. 100
License Expires: 12/31/15