STATE OF NEW MEXICO

ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

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

CASE NO: 20894

APPLICATION OF TEXLAND PETROLEUM LP
FOR APPROVAL OF A WATERFLOOD UNIT AGREEMENT,
AUTHORIZATION TO INJECT INTO THE BUBBA 4
STATE COM #001 WELL, AND TO QUALIFY FOR
THE RECOVERED OIL TAX RATE, LEA COUNTY,
NEW MEXICO

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

November 14, 2019

SANTA FE, NEW MEXICO

This matter came on for hearing before the New Mexico Oil Conservation Division, EXAMINERS LEONARD LOWE, KATHLEEN MURPHY, PHILLIP GOETZE, DEAN McCLURE, and LEGAL EXAMINER ERIC AMES, on Thursday, November 14, 2019, 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: Irene Delgado, NMCCR 253
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I N D E X



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

HEARING EXAMINER LOWE: We are now back on the record, and we'll continue the hearings for today. Our next case on the docket will be case Number 20894, which is Texland Petroleum for a waterflood.

Call for appearance.

MR. RANKIN: Good afternoon, Mr. Hearing Examiner, may it please the Division. This is Adam Rankin appearing on behalf of the applicant in this case. We have four witnesses.

HEARING EXAMINER LOWE: Okay. May the witness stand and be sworn in.

(Oath administered.)

HEARING EXAMINER LOWE: Are there any other appearances?

(No response.)

MR. RANKIN: With that, Mr. Examiner, I call our first witness, Mr. Wilson Woods.

HEARING EXAMINER LOWE: Mr. Woods, okay.

THE WITNESS: Good afternoon.

HEARING EXAMINER LOWE: Good afternoon.

WILSON WOODS

(Sworn, testified as follows:)

DIRECT EXAMINATION

BY MR. RANKIN:

**Q. Mr. Woods, would you please state your full name**

**for the record?**

A. Wilson Woods.

**Q. By whom are you employed?**

A. I'm employed by Texland Petroleum LP.

**Q. In what capacity?**

A. I'm their vice president of land and legal.

**Q. Have you previously testified before the Division?**

A. Yes, I have.

**Q. Have you had your credentials as an expert in petroleum land matters accepted as a matter of record?**

A. Yes, they have.

**Q. So just for the benefit of the Examiners, would just briefly review in summary your background experience in petroleum land work?**

A. I have a BA from the University of Texas at Austin. I have a JD from the Texas Tech University School of Law. I worked from 2006 to 2011 as an associate attorney in the oil and gas section for Vogel PC, a law firm in Ft. Worth.

I started in 2012 as the landman manager for Texland Petroleum. In 2017 I became the VP of land and legal for Texland.

**Q. You are familiar with the application that was filed in this case?**

A. Yes.

**Q. You are familiar with the status of the lands within the proposed unit area and the area surrounding your proposed injection?**

A. Yes.

**Q. And you are also familiar with the efforts to obtain preliminary approval from the State Land Office?**

A. Yes.

MR. RANKIN: Mr. Examiner, at this time I would tender Mr. Woods as an expert in petroleum land matters.

HEARING EXAMINER LOWE: He is so qualified.

MR. RANKIN: Thank you very much.

BY MR. RANKIN:

**Q. Mr. Woods, if you would you, please, in front of you there is an exhibit packet notebook marked as Exhibit Number 1. Will you please turn to that first exhibit and review for the Examiners what this exhibit shows?**

A. This exhibit is a simple plat of our proposed waterflood unit.

**Q. And what is identified within that unit area?**

A. We have three tracts shown, and we have three wells -- existing wells shown, the Bubba 4 State 1, the Walter Number 4 and the Jeffrey Number 4.

**Q. What is it that Texland is seeking with this application? There is a couple of different components.**

A. Yes. We are seeking four different things. First, we are seeking approval of the Bubba Strawn unit. It is planned to be a voluntarily waterflood unit. We are seeking authorization to inject into the Bubba 4 State Com Well. We are seeking authorization to convert future wells in the unit area to injection administratively without going to hearing, and we are seeking approval for EOR tax credits.

**Q. Now, as to your testimony, you will be providing an overview of the unit agreement and plan of operations in the notice you provided, but the other witnesses will be providing technical testimony, geology, engineering, and the proposed injection; is that correct?**

A. That's correct.

**Q. As well as another witness will be testifying on the EOR tax credit you are requesting?**

A. Yes.

**Q. Let's talk about the unit now. You mentioned it's going to be a voluntary waterflood; is that correct?**

A. That is correct.

**Q. How many acres will be comprised?**

A. It is going to be three 80-acre tracts, so 240 acres.

**Q. What is the status of the lands that comprise the unit.**

A. All of it is state acreage.

**Q. All state?**

A. Yes.

**Q. What is the unit interval in here, the formation you are proposing to unitize?**

A. The unitized interval is the stratigraphic equivalent of 100 feet above of the top of the Lower Strawn formation and continuing to 100 feet below the base of the Lower Strawn formation. The specific depths of that are identified in the unit definition.

**Q. So let's go over to your second tab, Exhibit 2, in the packet there. Is that a copy of the proposed unit agreement?**

A. Yes, it is.

**Q. And is the unitized interval identified in Section 1.2 of that unit agreement?**

A. Yes.

**Q. And so it identifies in particular the stratigraphic interval and the well that was used as a type log for determining that well --**

A. That's correct.

**Q. -- interval. Now -- and that hasn't changed, has it?**

A. That has not.

**Q. Okay. So does this unit agreement generally set out the proposed acreage for this unitized area?**

A. Yes, it does.

**Q. And does it identify the basis for participating in those tracts and the production from the wells you are going to be producing from this unit?**

A. Yes, it does.

**Q. Okay. Now, if you look at Article 5, is that where the tract participation formula is provided in your unit agreement?**

A. That's correct.

**Q. Would you just review for the Examiners what your participation in the tract is?**

A. Yes. It is a single-phase unit of -- it will be 50-50, first based on the ratio of the ultimate total oil and oil equivalent recovery from each tract to the ultimate oil and oil equivalent recovery from the entire unit area.

The second half will be the ratio of Phi H calculated for the well on each tract compared to the sum of Phi H calculated for each well cumulatively in the unit area.

**Q. We have another witness who can testify in more detail about the basis for that tract participation?**

A. That is correct.

**Q. This is sort of the overview of the general approach here for how you come to allocate production?**

A. Yes.

**Q. Okay. Now, looking at, if you would, within that same exhibit, towards the end there is an Exhibit A attached, which is Page 31 of 34 of that exhibit.**

A. Yes.

**Q. Does that Exhibit A identify the tracts that will comprise the unit?**

A. It does identify each tract, the accompanying lease and the unit participation factor for each tract.

**Q. And flipping over to the next exhibit, attached to that exhibit is B, what does that show?**

A. This is the plat of the unit area reflecting Tracts 1, 2 and 3 and also reflecting the three wells involved.

**Q. Now, just while we are on this topic right here, which of these three wells is proposed to be the initial injection well for the waterflood well operation?**

A. The Bubba Well is proposed to be the first injector.

**Q. At some later time another well may be converted to injection based on once you see a positive response?**

A. That is correct.

**Q. Another witness will be identified, and he will be discussing that in more detail?**

A. Yes.

**Q. Now, is there also a proposed unit operating**

**agreement?**

A. Yes, there is.

**Q. Has that been identified as Exhibit 3 in your exhibit packet?**

A. Yes, it has.

**Q. Does that unit operating agreement set out the the standard provisions for management of the unit?**

A. Yes, it does.

**Q. Does it also identify the rates and fees for the working interest owners?**

A. Yes, it does.

**Q. Does it provide a methodology of procedures for making elections and voting for costs related to unit operations?**

A. Yes.

**Q. Does it also set out the accounting procedures?**

A. It does.

**Q. Otherwise, it has other general standard provision for operating the unit -- for how to operate the unit?**

A. Yes.

**Q. Now, you have notified the State Land Office, provided them with a copy of the proposed unit agreement and unit operating agreement?**

A. Yes, we have.

**Q. And you also discussed with them the plan of operations, the unit agreement plan you have in place for this unit?**

A. Yes.

**Q. Tell me a little bit about what the State Land Office, your meetings with them, what their position is?**

A. They have fully reviewed our plans and engaged in a long discussion about it, and they are in full support of the plan.

**Q. Has the State Land Office prepared a preliminary letter of approval for this unit?**

A. Yes, they have.

**Q. Has that been marked as Exhibit 4 in your packet?**

A. Yes, it has.

**Q. Now that you have their approval, I understand once you initiate, get approval from the Division, then you are prepared to go forward and the State Land Office will issue final approval. Is that your understanding?**

A. That is our understanding.

**Q. Let's talk a little bit more about the ownership in the unit and the notice you provided in anticipation of today's hearing.**

**If you would flip to what's been marked as Exhibit 5A in your notebook, is that a list of all the working interest owners that comprise the three tracts for**

**the new proposed unit area?**

A. Yes, it is.

**Q. Does it identify all the working interest owners who would be subject to this proposed unit?**

A. Yes, it does.

**Q. As well as the share of their expenses within the unit?**

A. Yes. It gives both each owner's interest by tract, and then on a unit basis, based on the factors for each tract.

**Q. There are some overrides as well within this unit; is that correct?**

A. That's correct.

**Q. Before I move on to them, do you have 100 percent commitment from each of these working interest owners?**

A. Yes, we do.

**Q. Now, the next exhibit, 5B, is this a list of all the, in addition to the working interest owners, does it include all of the royalty and overrides as well?**

A. Yes, it does.

**Q. Do you have 100 participation from the overrides as well?**

A. Yes, we do.

**Q. What did this exhibit show?**

A. This shows on both a tract basis and unit basis,

the revenue for each entity, royalty, working and overriding royalty interest owner.

**Q. In your opinion, is the application of those revenue interests and share of the working interest, is it fair and reasonable and protective of correlative rights?**

A. Yes.

**Q. Now, as to the unit itself, are there any current wells that are approved as injection wells within the unit boundary?**

A. No, there are not.

**Q. So the one you are looking at today for approval as the initial well is that Bubba Number 1 well?**

A. That's correct.

**Q. Is that a conversion from a well that's currently on production?**

A. Yes.

**Q. And you have another witness that will be talking about that in more detail?**

A. Yes.

**Q. And then you mentioned at the outset you are also seeking authority to convert future wells to injection through administrative process rather than having to come to hearing.**

A. That is correct.

**Q. And therefore, we will adjust the notice shortly,**

**but that is one way you don't have to come back to hearing and do this all over again. So you provide notice to everybody half mile outside the exterior boundary?**

A. Yes, we did.

**Q. So what is the, the injection interval here? Is it within a pool?**

A. It is. It is in Shipp Strawn Pool, Pool Code 55695.

**Q. So the proposed injection interval is totally within that pool code?**

A. Yes.

**Q. In your opinion, is the creation of the unit in the best interest of conservation, prevention of waste and protection of correlative rights?**

A. Yes.

**Q. So let's talk about notice now. We identified all the working interest, overrides, and royalty owners here. Have you provided notice to all of those parties?**

A. Yes, we have.

**Q. And it's that list identified behind Tab Number 6 in the exhibit packet?**

A. Yes.

**Q. That identifies the State Land Office, all work working interest owners and all the overrides we previously reviewed?**

A. Correct.

**Q. Now, in addition to those owners and interests within the proposed unit, we looked at this a moment ago, you have also identified all the affected parties within a half mile around the exterior boundaries of this unit on the proposal to inject; is that correct?**

A. Yes, we have.

**Q. Okay. And you did that so that they would have notice of you are seeking administrative authority at a future time to convert future wells to injection?**

A. Correct.

**Q. That's pursuant to Division rules which allow you to give that notice if you can; is that correct?**

A. Yes.

**Q. Now, Exhibit 7, is that the copy of the C-108 that was prepared for the Bubba 4 State Com Number 1 well?**

A. Yes, it is.

**Q. And another witness will testify as to technical aspects, but I wanted to review in detail the notice that was provided. If you would, Mr. Woods, turn to what's been marked as Exhibit -- Page 13 from that exhibit. Review for the Examiners, when you get there, what that map shows.**

A. This is a map reflecting our proposed unit and a half mile halo around the unit.

**Q. Now, that half mile halo around the unit is**

**indicated the the area within that red circle; is that right --**

A. That's correct.

**Q. -- or oval. The parties within that area between the unit boundary, which is indicated in yellow, and that red oval, are those the parties that you identified as receiving notice?**

A. Yes.

**Q. And that's the notice for the injection?**

A. Yes.

**Q. Now, as well, you have already discussed this, but to be clear, the surface acreage here is owned by the State Land Office?**

A. Yes, it is.

**Q. So they also got notice of the application, obviously, you discussed the application.**

A. Yes.

**Q. Flipping to your next Exhibit 8A in your packet, can you review what that exhibit shows?**

A. This exhibit shows a breakdown of each tract as we identified it in the half mile halo where ownership was different or there was a different operator involved in a particular tract.

**Q. So that's the basis for identifying all the affected parties for the injection proposal?**

A. That is correct.

**Q. Within each of those tracts you identified numerous parties required notice and those parties identified and listed in Exhibit 8B?**

A. Many, many parties, yes, sir.

**Q. In fact, this is a list not by tract because there are lots of duplicates, so those duplicate signatures were eliminated, but this contains all the interest owners within the unit, as well those in that in that halo area that you identified?**

A. That is correct.

**Q. In addition to the parties in this list that we just reviewed, you have confirmed and identified all valid and correct addresses for these parties?**

A. For these parties, yes.

**Q. But there are some parties for whom you are unable to identify a valid and correct address?**

A. That is correct. There were approximately 20 parties we could not identify an address for.

**Q. Are those parties listed on Exhibit 8C?**

A. Yes.

**Q. So these are the parties for whom you identified a name, but no valid or correct address?**

A. That is correct.

**Q. So next Exhibit 9, is that copy of an affidavit**

**that was prepared by me and my office reflecting that notice of the application of today's hearing was sent to all of those parties who are identified in these lists?**

A. Yes, it is.

**Q. Including the parties for whom you don't have a valid and correct address?**

A. Yes.

**Q. So in the next page of that exhibit, that's the letter that went out to all of these individuals?**

A. Yes, it is.

**Q. And the following page, is there a copy of the US Postal Service tracking information to each showing notices sent to each of those parties?**

A. Yes.

**Q. In some cases those addresses, notices are still reflected as being in transit?**

A. That is correct.

**Q. And that's just in case they did not go to sign for them. To the best of your knowledge and understanding, do all the addresses, nevertheless, were valid and correct?**

A. Yes.

**Q. That's based on your research looking at updated title in either the county records or BLM or OCD Division records for operators?**

A. That's correct.

**Q. There are lot of pages in that exhibit showing the status. Now as to the parties that you did not have a valid or correct address for, so called unlocatable parties, did you also instruct me to provide notice by publication to all those parties?**

A. I did, yes.

**Q. Is that notice of publication reflected by an affidavit contained behind Exhibit B10?**

A. Yes, it is.

**Q. And that very long advertisement includes all the names identified in the list including those for whom you don't have a valid and correct address; is that right?**

A. Yes.

**Q. Mr. Woods, were Exhibits 1 through 6, and 8 through 10 prepared by you or compiled under your direction and supervision?**

A. Yes, they were.

MR. RANKIN: Mr. Examiner, at this time I would move the admission of Exhibits 1 through 6 and 8 through 10 into the record at this time. And we will admit Exhibit 7 C-108 when one of the other witnesses testifies.

HEARING EXAMINER LOWE: Exhibits 1 through 6 and 8 through 10 are admitted for the case.

(Exhibits 1 through 6, 8 through 10 admitted.)

MR. RANKIN: Thank you. I have no further

questions at this time. Pass the witness for questioning by the Examiners.

HEARING EXAMINER LOWE: Dean?

EXAMINER McCLURE: No questions.

EXAMINER MURPHY: I have a quick question. The first exhibit with the tracts, the Bubba is the one that would be the injector?

THE WITNESS: Yes, ma'am.

EXAMINER MURPHY: Walter 4 is the type log for the basin?

THE WITNESS: Yes, ma'am.

EXAMINER MURPHY: And Tract 2, the Jeffrey is not --

THE WITNESS: The Jeffrey at the moment is another producer on the north end that could potentially be an injector depending on response at some point, but it's not part of the preliminary plan to make it an injector.

EXAMINER MURPHY: Why is it in there?

THE WITNESS: It's another well in the unit. It's an active producer at the moment.

EXAMINER MURPHY: How many wells are in the unit?

THE WITNESS: Three. All three are producers at the moment. We are proposing to convert one to an injector initially.

EXAMINER MURPHY: The other two?

THE WITNESS: We could potentially convert one more to an injector at a later date.

EXAMINER MURPHY: Thanks.

THE WITNESS: Yes, ma'am.

HEARING EXAMINER LOWE: Are you done?

EXAMINER MURPHY: Done.

HEARING EXAMINER LOWE: Mr. Goetze?

EXAMINER GOETZE: For the record, we don't have any previous unit in this area as far as secondary waterfloods?

THE WITNESS: No.

EXAMINER GOETZE: A clean history. Are you going to -- I guess it would be more to your questions, the capital cost and total project cost will be handled by a separate witness?

MR. RANKIN: We will cover that with an engineering witness.

EXAMINER GOETZE: We used to deal with these with two orders. So we combined them into a single one?

MR. RANKIN: Well, I know that in the past sometimes operators will have filed for a unit approval and EOR credit approval and separately for the C-108. I didn't see the reason for it, so we did it as one hearing.

EXAMINER GOETZE: It's not that big an area. It's only one lease.

MR. RANKIN: Yes.

EXAMINER GOETZE: I just don't want you to send too much to us. No more questions. Thank you.

HEARING EXAMINER LOWE: Okay.

MR. AMES: No questions.

HEARING EXAMINER LOWE: I have one question. You indicated on, I think it was Exhibit 8C is a table, a list of all parties that you could not locate; is that correct?

THE WITNESS: That is correct.

HEARING EXAMINER LOWE: And then you also reference that you sent out mailers to certain, to your initial list, your list in general, but you have not received anything back yet. So is that one that you haven't received back yet excluded from this list or how do you --

THE WITNESS: I believe this list would be, 8C would be folks we did not have an address for, period. 8B where they show are still in transit would be people we could find addresses for, but still waiting to to see if it was a good address or not.

HEARING EXAMINER LOWE: I just wanted clarification for that.

THE WITNESS: Yes, sir.

HEARING EXAMINER LOWE: That's all I have.

MR. RANKIN: No further questions, Mr. Examiner, I would ask that this witness be excused and call our second

witness, Mr. Brian Lee.

THE WITNESS: Thank you.

HEARING EXAMINER LOWE: Thank you.

BRIAN LEE

(Sworn, testified as follows:)

DIRECT EXAMINATION

BY MR. RANKIN:

**Q. Mr. Lee, will you please state your full name for the record?**

A. Yes. Brian Lee.

**Q. By whom are you employed?**

A. Texland Petroleum LP.

**Q. In what capacity?**

A. Vice president of exploration.

**Q. Have you previously testified before the Division?**

A. No, I have not.

**Q. Will you please briefly summarize for the Examiners your education and relevant work experience as a geologist?**

A. Yes. I completed a bachelor's and master's degree at Oklahoma State University in '78 and '80 respectively. And I went to work for Unical Local Corporation in Oklahoma City in 1980, and I worked there for seven years on various basins, none of them in West Texas.

And I went to -- I was transferred to Midland by Unical in '87 as district geologist for the Permian Basin and was in charge of geologic supervision there. And then in '90 I was exploration manager for Unical for the Permian Basin until '92. And then from '92 until the present, I worked for Texland Petroleum in Ft. Worth the entire time in the Permian Basin. So about 27 years of total experience in the Permian Basin.

**Q. Are you familiar with the application that was filed in this case?**

A. Yes.

**Q. You are familiar with status of the lands and have conducted a geologic study of the land that's the subject of this proposed unit?**

A. Yes.

MR. RANKIN: Mr. Examiner, at this time I would tender Mr. Lee as an expert in petroleum geology.

HEARING EXAMINER LOWE: He is so qualified.

MR. RANKIN: Thank you very much.

BY MR. RANKIN:

**Q. Mr. Lee, just to reiterate, what is the formation that is targeted for unitization?**

A. The Strawn limestone.

**Q. To be exact, the unitized interval is what?**

A. The unitized interval is, as shown in our type

log, is from 10,945 feet down to 11,132 feet, and then 100 feet above and below the Strawn limestone tops and bottoms.

**Q. Turn to Exhibit 14 in your packet, skipping ahead is a cross section, we'll address the aspects of the cross section separately, but can you identify in this exhibit the log that is used to identify the unitized interval?**

A. Yes. That is the central log, that's the Walter Well, and that's the one that I just quoted the depths from. The interval there is all Strawn Limestone.

**Q. And if the Division would like, would you be able to provide them with with a single fact log showing that one log shown identifying the unitized interval?**

A. Yes.

MR. RANKIN: If you would like, we can send you a single type log identifying the unitized separately for the record.

HEARING EXAMINER LOWE: That would be fine.

MR. RANKIN: Okay.

BY MR. RANKIN:

**Q. Now, thank you very much, Mr. Lee. We talked a little bit about the geology here. Let's turn back to Exhibit 11. And if you would, just review for the Examiners what's on this exhibit, and discuss, if you would, the proposed unitized interval in the overlying-underlying formations.**

A. Okay. This is the southern-most well in our unit, the Bubba State, and it's indicated on the map with the red star, and the log is there to the left.

The red line at the top is the Top Lower Strawn Carbonate. The base -- basin lows red line is the top of the Atoka. The Lower Strawn Shales above and the Atoka Shales below form good seals for our reservoir interval.

The logs shown are from left to right, and there's a gamma ray log on the extreme left, and then a neutron density, both of those logs are shown together next, and they indicate the porosity development within the Strawn, and basically everything above 2 percent porosity is typically pay in this interval.

And perforations for that well are shown there in kind of the center track in kind of a red or purplish color. And then the final set of logs to the right are resistivity logs, and what they show by the leftward deflection is the existence of permeability within those zones.

And the Strawn Limestone's form is kind of an out-of-ramp setting, and they build up from kind of these potato-chip like developments associated with sponges and bryozoa, and they can be very resistant to currents and so on, so they can reach a pretty tremendous height in the way that we think of carbonate build-ups these days, and it's not uncommon for a totality of 100 feet or more to be

present.

So they are rather steep-sided. They are rather non -- they are, in a sense, they are kind of well connected both vertically and laterally within any one of these mound developments. But the off-mound part of it is filled with mud, totally impermeable. So you end up with a great deal of separation between the individual mound developments in sort of an unusual way. Typically it doesn't get that much separation. Here we have great separation.

**Q. You will be able to discuss that more -- in more detail when we look at that isopach map?**

A. That's correct.

**Q. Before we leave this exhibit though, just to be clear, it's your opinion that the overlying-underlying formations here are sufficiently impermeable to contain the injection within the target interval?**

A. Yes, they are.

**Q. Okay. Is there anything else you want to discuss on this exhibit, Mr. Lee?**

A. No.

**Q. So let's look at your next exhibit. You prepared a structure map of the injection zone; is that right?**

A. That's correct.

**Q. That's on Exhibit 12. Will you review what that shows and kind of provide an overview of the geology here?**

A. Yes. This map is constructed on the top of Strawn Limestone, and it gently dips from sort of southwest to northeast. And it is gentle-dipping rocks that other prominent features on this map are, there's a northwest to southeast incline in the central portion of the map, and that's, in probability, caused by differential compaction over these upstanding mounds. So it's evidence for the disconnection that we'll later show on the isopach map. And it's rather typical to see at least some indication of the mound development from the structure maps themselves.

**Q. Now, your next exhibit, Exhibit 13, is an isopach map, and would you tell the Examiners what that shows?**

A. Yes. So there is four different colors here on the map, and each one of those is an individual mound development. The one that we are unitizing is the one in black, and it's shows a cross section also in blue across it.

The others are, are completely separate mound developments in the same depositional system, but separated mounds. And you can see that you've got this north-south oriented mound development, and we will show on the cross section to follow it's well connected throughout its entirety, but as you move off the mound they, they are completely separated by mud stones which are impermeable.

**Q. Based on your analysis, and the data you**

**reviewed, is it your opinion that this proposed unitized area has been reasonably redefined by development to date?**

A. Yes.

**Q. Now, also based on your assessment, let's go to your next exhibit, I guess -- before we do, indicate here, I don't think you touched on it yet, from A to A prime, are those the wells you identified for a cross section?**

A. Yes, they are.

**Q. So let's go ahead and review that cross section on Exhibit 14. Just explain the significance here of the cross section in your analysis.**

A. Yes. So this is a north to south cross section with north on the left. And you can see the porosity development in each one of the three wells in the central portion. And the two green lines define the top and base of the porosity, and you can see that there is a good continuity between the three wells, good development, very similar porosities ranging from between 2 to 12 percent. Permeabilities are good, and we'll talk about that some more later.

But the combination of the algo buildup, combined with the sponges and bryozoa give you a really nice uniform-ish development of the porosity and permeability and well contained within the system.

**Q. Based on the cross section, in your assessment is**

**the target interval within this unit continuous and persistent throughout the unit?**

A. Yes.

**Q. Is it your opinion that the waterflood operation will be contained within the zone?**

A. Yes.

**Q. If I could, Mr. Lee, I just want to step back real quick to the exhibit on the isopach. And I just want to make sure it was emphasized or I understood clearly that the significance of these, these accumulations is that, in your opinion, the injection -- the injection from the waterflood operations will be contained within the bolded black outline here that is within the unit area?**

A. Yes.

**Q. That's the significance of this isopach is that, not only do you have containment above and below, but based on the structures you described, we've got really strong containment on the outer boundaries?**

A. That is correct.

**Q. In your opinion, does that make this proposed unit area a good candidate for waterflood?**

A. It does.

**Q. And just explain in summary why that is.**

A. So you have a really nice relatively homogeneous package of rocks with good porosity and permeability, well

contained top and bottom, well connected laterally within the wells, and good evidence to support that contention.

**Q. So ideally, in laymen's terms, what happens when you inject in the Bubba State is that your waterflood injection fluids are going to stay in that area?**

A. That's correct.

**Q. And that translates into an efficient conversion with production. In other words, you are not losing any of the waterflood out, it's staying in the zone, and you are getting production out of your producers?**

A. That's correct.

**Q. As a result of that injection?**

A. That's correct.

**Q. Now, you are saying the proposed unit is an ideal waterflood candidate?**

A. Yes.

**Q. There are no other faults or pinchouts or geologic impediments that you have identified within the unit that would impede an efficient waterflood project?**

A. Yeah, there are none of those things.

**Q. Now, let's talk real quickly about fresh water. Are there any fresh water zones within the area in different depths?**

A. Yes. The Tertiary Ogallala is present from about 50 feet to 150 feet, and the Triassic Santa Rosa from 280

feet to about 2007 feet.

**Q. And you are going to put any other fresh water zones below your proposed injection interval?**

A. That's correct.

**Q. In your opinion, you testified that the ceiling strata will protect the fresh water zone as a result of your injection?**

A. Yes, that is also correct.

**Q. Okay. In your opinion, Mr. Lee, will the granting of this application be in the best interest of conservation, prevention of waste, and protection of correlative rights?**

A. Yes.

MR. RANKIN: At this time, Mr. Examiner, I would move the admission of Exhibits 11 through 14 into the record.

HEARING EXAMINER LOWE: We will accept Exhibits 11 through 14 for the record.

(Exhibits 11 through 14 admitted.)

MR. RANKIN: I have no further questions at this time. I pass the witness.

HEARING EXAMINER LOWE: Mr. McClure?

EXAMINER McCLURE: Now, what you are looking at right now, you are saying three wells are completely isolated?

THE WITNESS: Yes.
EXAMINER McCLURE: From anybody else's production?
THE WITNESS: That is correct.
EXAMINER McCLURE: And that the dome is surrounded by relatively impermeable mud; correct?
THE WITNESS: That's correct.
EXAMINER McCLURE: What are you basing that off of? Do you have seismic, or you just looking at logs?
THE WITNESS: We actually have two main sources of data other than the log data. The first is we do have a 3D seismic, proprietary 3D seismic survey across this interval and more. And then there's, as our reservoir engineer will discuss, there is good pressure data also showing the separation.
EXAMINER McCLURE: That's also showing this?
THE WITNESS: Yes, sir.
EXAMINER McCLURE: I have no other questions for this witness.
HEARING EXAMINER LOWE: Ms. Murphy?
EXAMINER MURPHY: Along those lines, are they phylloid?
THE WITNESS: Yes, they're phylloid acro mounds.
EXAMINER MURPHY: So if you injected the Bubba, would the well that would be producing the Jons 4, is

that --

THE WITNESS: No, the Jons 4 is essentially a dry hole. It's got just a tiny bit of pay if any. It's probably impermeable. So our expectation is that the pressure support from the injection of the fluids is going to be -- we are going to see that in the Walter and Jeffreys wells.

EXAMINER MURPHY: Okay. All righty. Thank you.

EXAMINER GOETZE: One point of clarity. So what was driving this reservoir originally?

THE WITNESS: It's gas solution drive. It makes also almost no water.

EXAMINER GOETZE: Okay. That was my other question. Thank you.

MR. AMES: No questions.

HEARING EXAMINER LOWE: I just want to find out for sure -- well, you stated that the fresh water in the water part of your presentation, you indicated that the Ogallala is between 50 and 150 feet?

THE WITNESS: Yes, sir.

HEARING EXAMINER LOWE: You indicated another water source of 280 to 2017?

THE WITNESS: Yes.

HEARING EXAMINER LOWE: What is that one?

THE WITNESS: That's the Santa Rosa.

HEARING EXAMINER LOWE: Santa Rosa. And when you say fresh, do you mean potable?

THE WITNESS: Certainly the Ogallala is truly a potable reservoir. The Santa Rosa, not really, the chlorides are pretty high. But it's considered to be a potential fresh water source because it has low enough chlorides to perhaps have some value some day, but it's not a very strong fresh water source in terms of usability for human beings.

HEARING EXAMINER LOWE: 10,000?

THE WITNESS: It's like more like 6- to 7000 parts per million.

HEARING EXAMINER LOWE: Just for clarification for sure for me, when you give these lengths, is it -- it's in reference to what? Is it 50 or 100 feet?

THE WITNESS: Oh, yeah. They are feet. I'm sorry, yeah. So you are talking about on the isopachs?

HEARING EXAMINER LOWE: Yeah.

THE WITNESS: So these things would be -- a good way to visualize them, if I'm answering your question, these are about like an 8- to 10-story building, and so it's almost like a block of buildings all agglomerated together. And think of the streets as being the separate between the buildings, and then those streets are filled with mud giving you separation.

So if you follow that analogy, it kind of gives you a visual picture for how steep the sides are and how well contained it is.

HEARING EXAMINER LOWE: All right. That's all the questions I have for now.

THE WITNESS: Thank you.

MR. RANKIN: Thank you, Mr. Examiner. With that, I would like to call our third witness, Mr. Steve Neuse.

STEVEN HENRY NEUSE

(Sworn, testified as follows:)

DIRECT EXAMINATION

BY MR. RANKIN:

**Q. Mr. Neuse, will you please state your full name for the record?**

A. Steven Henry Neuse.

**Q. And for the benefit of the recorder, will you please spell your last name?**

A. N-E-U-S-E.

**Q. Will you tell me by whom you are employed?**

A. Texland Petroleum LP.

**Q. In what capacity?**

A. I'm vice president of reservoir engineering.

**Q. Have you previously testified before the Oil Conservation Division?**

A. Yes.

**Q. For the benefit of the Examiners, will you please briefly review your educational background and your relevant work experience as a reservoir engineer?**

A. I graduated from Texas A&M University in 1977 with a BS in petroleum engineering. And then I stayed there for four years of post graduate work before going to work for Hudson Consultants in Tulsa, Oklahoma.

I initially was a senior reservoir engineer, and then finally as the reservoir engineering manager for Hudson Consultants, at which point we were working on projects in the entire mid continent, the Permian Basin, the Gulf Coast, the Rocky Mountains. We had some Venezuelan projects that we worked on.

It was a fairly wide range of waterfloods and primary recovery. Then I left Hudson Consultants in 1989, went to work for Apache Corporation in Tulsa again from 1989 to '91 as a senior reservoir engineer. And then in '91, Bass Enterprises hired me as the senior reservoir engineer. I went to their Midland office to work the Permian Basin area, and eventually ended up in the Ft. Worth office and retired from Bass Enterprises as the vice president of engineering with them, and then went to work for Texland Petroleum in 2017.

**Q. And you are familiar with the application filed in this case?**

A. Yes.

**Q. And you are familiar with the engineering study in support of the application?**

A. Yes.

MR. RANKIN: At this time, Mr. Examiner, I would retender Mr. Neuse as an expert in reservoir engineering.

HEARING EXAMINER LOWE: He is so qualified.

MR. RANKIN: Thank you very much.

BY MR. RANKIN:

**Q. Now just to help make sure that my panel of Examiners is following along with us, Mr. Neuse, you are going to be testifying on the operational aspects of this proposed waterflood, as well as the data and engineering calculations supporting the oil recovery tax rate request; is that correct?**

A. The reservoir engineering aspects, the operational design, and the, the tax recovery.

**Q. Okay. So you have conducted an analysis and calculations that support your conclusion regarding the potential for waterflood in this unit?**

A. Yes, I did.

**Q. And it's your opinion that the proposed waterflood unit is a good candidate?**

A. Yes.

**Q. And you've -- you've got those calculations to**

**support your conclusions today?**

A. Yes.

**Q. So let's go ahead and start out by talking a little bit about the application itself.**

**If you would, Mr. Neuse, turn to Exhibit 15 in your exhibit packet. Is that copy of the application that was filed for this case today?**

A. Yes, it is.

**Q. If you would, please turn to Page 3 of that application, and looking at Paragraph Number 9, do you see where it states that the applicant, Texland, is requesting approval to be qualified for the Oil -- Recovered Oil Tax Rate under the New Mexico statutes?**

A. Yes.

**Q. Is that still the case today?**

A. Yes, it is.

**Q. Looking at the next Paragraph Number 10, you see there is some project data regarding the costs and other data related to the proposed waterflood operation?**

A. Yes.

**Q. Do you incorporate those values and numbers in your testimony today?**

A. Yes, I do.

**Q. And are those all -- any updates or changes to any of those figures?**

A. The only clarification is on Section I, the anticipated injection volumes. The 750 barrels of water per day average, that actually is barrels of water per day per well over the life of the injection well that we are looking at.

They actually start off as mentioned at very high injectivity, 2000 barrels of water a day, and then they will actually stabilize at about 600 barrels of water a day per well. The 20 million barrel total is the total over the life that will go through the injection wells, but a lot of that will be recycled water from the flood once we get a breakthrough.

**Q. So the 750 is per injection well. Right now we are seeking authority for one injection well with the potential for a future injection well down the road?**

A. That is correct.

**Q. Okay. Now, let's talk a little bit more about the unit as it exists today, if you would. And let's do that by referring to what's marked as Exhibit 16 in your exhibit packet. If you would, just kind of walk through for the Examiners the current status of each of these wells within the boundaries as they exist.**

A. The current status of the wells, the green wells indicated on Exhibit 16 are the current active wells, the Bubba State, the Walter, and the Jeffrey.

The Bubba State is currently producing only gas. It is a flowing well. It has never been on artificial lift.

The Walter is producing gas and oil under rod pump, and the Jeffrey is producing gas and oil under rod pump.

**Q. There are some other wells indicated on your exhibit as well.**

A. Yes.

**Q. And what is the status of those wells?**

A. The other wells are all plugged and abandoned at this time.

**Q. And no plans at this time to reenter them or turn those to production within the unit boundaries?**

A. No. And if you actually look at the isopach map, you will see they do not encounter the reservoir that we are intending to flood.

**Q. Okay. Now, you prepared a summary of the production history from -- of these wells; is that correct?**

A. Yes, I did.

**Q. Has that been marked as Exhibit 17 in your exhibit packet?**

A. Yes.

**Q. If you would just briefly give the Examiners the salient points that you would like to highlight in that exhibit.**

A. Two, two major points I would like to make with this particular exhibit. The question came up about these other wells. If you look at the Tipperary State Com Number 2, which is in the lower group of wells there on Exhibit 17, this well was the first well that was drilled in the area that was productive, and it actually started producing January 1, 1986.

It produced 387,000 barrels of oil and about 6/10 of a BCF of gas and was plugged and abandoned in 2000 because of pressure depletion. Now it actually is connected to another accumulation so there was more than that produced out of that other accumulation, but out of this wellbore, this was the amount that was produced.

The other two wells, the Lea YL State Number 1 and Jons 4 State were both completed as dry wells, one in 1984 and one in 1986 after testing these formations and other shallower formations.

Our first well drilled and completed was the Walter Number 4. It has, to date -- it was completed in October of 2002. To date it has produced 417,000 barrels of oil, only 4584 barrels of water, essentially no water, and 1.1 BCF of gas.

The next well drilled was the Jeffrey Number 4 in 2003. It's produced 22,000 barrels of oil, 2750 barrels of water, and about a half a BCF of gas.

And the last well drilled in the group was the Bubba 4 State Com Number 1. It actually was completed in 2005. It's made 41,000 barrels of oil, and about 7/10 of a BCF of gas, and only 764 barrels of water.

The total that has come out of the formation that we are looking to waterflood is 681,000 barrels of oil, and 2.3 BCF of gas.

**Q. It also identified the total volume of water produced as well?**

A. The total volume of water is only 8,098.

**Q. Very good. Now, just looking at this list, have you identified a potential future well for conversion to injection at a later date?**

A. The analysis indicates that the Bubba 4 State Com Number 1 is our first well that we would select for conversion to injection.

**Q. And there's another future well that you may identify later for conversion to injection; is that correct?**

A. Yes. The next well that we would convert to injection based upon the study that we have done would be the Jeffrey Number 4.

**Q. We'll talk about that in more detail shortly, but that's the later well that you may identify at a later date for conversion?**

A. Yes.

**Q. Now, we've talked about the production history and the volumes of production fluids that have been produced from the area. And in summary, there will be three wells in the proposed unit, waterflood unit.**

**The first well that would be the injection well would be Bubba 4 State Com Number 1 well. The producing well would be the Walter 4; is that correct?**

A. Well, the initial producing wells will be the Walter 4 and the Jeffrey 4.

**Q. And then at a later date, Texland may identify, upon response of production, later converting the Jeffrey 4 into an injection well as well?**

A. That is correct.

**Q. Okay. So then let's talk about the waterflood pattern and how you intend to operate the waterflood. If you would, Mr. Neuse, turn back to Exhibit 13 to the isopach map that Mr. Lee testified about. If you would, referring to that map, explain to the Examiners how Texland intends to operate its waterflood in this area.**

A. The waterflood in this area, based upon the numerical model of studying that we did as to the optimum way of flooding this particular geometric configuration of the wellbores and the formation, the most optimum case would be to do edge injection using the Bubba State Number 1 on the southern end of the accumulation and the Jeffrey 4 on

the northern end, and to actually sweep the oil towards the center to the Walter well.

**Q. Based on the Mr. Lee's testimony, you've got these lateral constraints that would keep your waterflood in place, and that would increase the efficiency of the unit operation; is that right?**

A. The reservoir, based upon what we have seen from the analysis, is very well bounded and is contacted by those three wells.

**Q. And let me just ask you a little bit about the timing of this conversion to waterflood. Is it your opinion that conversion at this time to secondary recovery waterflood operations is not premature?**

A. It is not premature.

**Q. And that's based on the fact these wells are currently only marginal producers; is that right?**

A. The current set of wells, the actual Walter well is currently making -- well, as of last month, it was 16 MCF a day, and no oil, and no water, and so far this year it's made 6.8 million cubic feet of gas and 153 barrels of water for the first nine months, so a little bit less than a barrel a day.

The Jeffrey Number 4, which is a pumping oil well, made a half a barrel of oil a day in October of this year, and it's made 329 barrels of oil, and essentially no

gas, 20 barrels of water for the first nine months of 2019.

And the Bubba well, that's currently making 5 MCF a day with no water and no oil.

**Q. So, in short, the time has come.**

A. The wells are marginal at this time. We are still making a little bit of money off of them, but they do need to have something to enhance their recovery.

**Q. Okay. Now, are there other waterfloods operating in the vicinity of the proposed waterflood that would maybe serve as an analogy here?**

A. We have identified three waterfloods, all to the north that are in the Strawn, they are analogous in several ways.

One is that they utilized primary wellbores to implement their projects. This is 11,000 feet. It is difficult to economically support a new well for secondary recovery.

And then also they have, most of them have similar patterns. The Chambered Strawn Unit eight miles to the north, it's a similar pattern, it's edge well or edge water drive.

There is a Gecko State Number 1 Unit 3, which is three -- Unit -- which is three miles to the northeast. This is a two-well pressure maintenance project, just has the two wells. And then the Cartership Unit 2.7 miles to

the north has two injectors and two producers.

**Q. Okay. Now, so waterflooding and waterflooding-related operations have been undertaken in the same zone?**

A. Yes, they have.

**Q. Okay. Now, you have made some calculations to support the oil recovery tax requests.**

A. Yes.

**Q. Is that right? And those are -- in fact, you have actually modeled your projections as well, is that correct, based on the economics in your projections for recovery?**

A. Yes.

**Q. And would you turn to Exhibit 18, just review for the Examiners what you did to calculate those values and the model that you came up with.**

A. We constructed a finite difference simulator using the geology from Mr. Lee, and cross correlated that with material balance data that we had on the Walter Number 1 prior to it hitting the bubble point, we were using PVT data that we have on another Strawn well in the area.

And had, after doing the history match, determined that the material balance and the modeling, the geology supported 2.7 million barrels of original oil in place, 2.4 BCF of gas, and based upon the log analysis in the low water saturations, only about a half million barrels

of water.

The primary recovery that we have seen is about 25 percent of the original oil in place and 96 percent of original gas in place. The model predicted the bottom hole pressure should be around 100 pounds and we verified that with the pressure data that we took off the Bubba well, and it was about 116 pounds.

**Q. Now, in addition to looking at your economic model and your engineering model, have you also projected what your estimated recoveries will be upon commencement of your waterflood operation?**

A. Yes.

**Q. Is that reflected in your Exhibit 19?**

A. Yes. We actually took the numerical simulator and tried various injection scenarios, and that's where came up with the optimum injection scenario being the edge injection from the two wells, the one to the north and one to the south.

And Exhibit 19 shows the response that the model says that we should be looking for. We have a very high gas saturation. We produce a lot of gas out of this reservoir, and so the fill-up is going to be about three to four years. We are looking for a peak response from the well of about 84 barrels of oil per day, and then a very long tail on the flood-out.

**Q. So in summary, do you expect to see a significant waterflood response here?**

A. Relative to where we are right now, yes.

**Q. Yeah. And tell me a little bit about what your anticipated -- current operating costs are and what your anticipated increased costs are for capital for the project.**

A. Currently we are operating those three wells for $8400 a month. We estimate the operating cost for the secondary recovery project to be $18,690 a month, and the cost to perform the well conversions and install the injection facilities is $1,583,900.

**Q. And have you also calculated the value of what you anticipate being additional reserves recovered from this operation?**

A. Yes.

**Q. What would that be?**

A. The response that you see on Exhibit Number 19, doing economic analysis of that using an AIRES model -- economic modeling program, we calculate the value of these additional reserves to be $9,115,655.

**Q. And when you do that calculation of the value, what was your price point that you used to make that calculation?**

A. We actually on the calculation at that time used the NYMEX forward strip as of September 2019 with a $3.15 -

$3.15 per barrel, and this resulted in an average realized price over the life of the project of $50.95 per barrel, and essentially was almost a flat-price scenario. There was not very much variation.

**Q. And is that, in your opinion, a reasonable price point to use for your estimate for your model?**

A. For the calculations at that time, it was -- it was realistic. We are seeing a little bit higher prices now, but the fluctuation is such that I think this is a good estimate.

**Q. Now, based on your analysis, and based on your estimate of costs, capital costs and operating costs and the value of the additional reserves, is it your opinion this project will be economical?**

A. Yes.

**Q. And in your opinion, will the value of the oil and gas recovered waterflood operations exceed the unit cost plus a reasonable profit?**

A. Yes.

**Q. And is it your opinion that at this time conversion to waterflood operations is -- is reasonable and necessary to substantially increase the ultimate recovery of reserves within the area?**

A. Yes.

**Q. Now, let's see. You have also, I think, prepared**

**sort of an overview of the forecast summary for production down the road as well, not -- in addition to your graph, if you would, Mr. Neuse, turn to Exhibit 20 and just review for the Examiners what this exhibit shows and your forecast for future production?**

A. The Exhibit 20 is basically a summary of the model results and the resulting economic analysis. We are predicting waterflood reserves of 589,000 barrels of oil additional recovery. As I said, the average sustained injection once we get breakthrough and in a steady state after the fill-up, we are looking about 600 barrels of water per day per well, economic life of 46 years, with a peak rate of 84 barrels of oil.

The primary recovery as I testified before, is 25 percent on the oil and 96 percent on the gas. Secondary recovery will be 21 percent and essentially 1.5 percent additional on the gas because essentially all the gas is gone. But that gives us a little bit under a one-to-one secondary-to-primary ratio, which, with this quality of rock, is not unexpected.

Value of the secondary reserves, net of investment costs, is $9 million as far as the cash flow, the net cash flow, and the present worth of that at a 9 percent discount factor net of investment cost is $2.1 million.

**Q. So based on that, again, you are, your opinion is**

**that it would be an economic project?**

A. Yes.

**Q. Now, just in summary, it's your opinion this project is obviously going to be technically feasible.**

A. Yes.

**Q. And in your opinion, will the waterflood operations result in substantially more reserves than if it were to remain on primary production at this point in time?**

A. Yes, based on.

**Q. Not to put not too fine a point on it.**

**Now I just wanted to touch on -- backtrack briefly to review the unit participation formula, the tract participation formula that Mr. Woods testified to earlier.**

**If you would, Mr. Neuse, flip back to Exhibit 2 in the exhibit packet, and turn the page to Article 5, which is on Page 5 of that exhibit. If you would, just explain for the Examiners the basis for that particular unit participation formula in this case. I will let you get to that page, and let me know once you do.**

A. Yes, I have the page.

**Q. All right. If you would just explain what the basis is for that tract participation formula -- explain how you came to that formula.**

A. This is what we call a single-phase formula. If we would have had significant remaining primary production,

you would normally see a two-phase formula which would account for the remaining primary, and then a reversion once the remaining primary was recovered.

But since we are basically at the end of the primary, we had just tried to quantify a reasonable participation based upon the parameters that we do have available to us.

The A factor is the ratio of the ultimate total oil and oil equivalent using a 6 MCF per barrel oil equivalent for a, a prorate of BOE, and we assign that to each tract based upon the amount of oil and gas produced through the wellbore that is in this particular reservoir on those individual tracts.

As I testified before, the Tipperary was producing out of a different reservoir and will not participate in this flood.

The B factor is a ratio of the porosity thickness or Phi H based upon the log calculations of the wells that penetrate and will participate in this waterflood for those individual tracts. And we use that to come up with an equity participation factor for each tract.

**Q. Now, based on your experience and your assessments, is that participation formula, is it fair and reasonable and equitable in each of the owner's interests within this area?**

A. Yes.

**Q. And you presented that formula to the State Land Office, and they agreed that it was fair, adequate and reasonable as to the allocations for each of the owners in the tract?**

A. Yes.

**Q. Now, just to follow up on the oil recovery tax rate. Once you commence waterflood operations and obtain a positive response, will you submit an application to the Division indicating that you have received a positive production response as the rules require?**

A. Yes.

**Q. And will you also submit any reports to the Division reflecting waterflood operations and status of waterflood on an annual basis?**

A. Yes.

**Q. Mr. Neuse, were Exhibits 15 through 20 prepared by you or under your direction and supervision?**

A. Yes, they were.

MR. RANKIN: Mr. Examiner, at this time I would move the admission of Exhibits 15 through 20 for the record.

HEARING EXAMINER LOWE: Exhibits 15 through 20 will be admitted for the record.

(Exhibits 15 through 20 admitted.)

MR. RANKIN: Thank you very much. At this time I

pass the witness.

HEARING EXAMINER LOWE: Mr. McClure.

EXAMINER McCLURE: I have a few questions.

Obviously you had some dry holes adjacent to this as well as your actual bottom hole pressure which in line with the bottom hole pressure in your model, based off of that is where you are feeling this is isolated from other production, or is there additional pressure data?

THE WITNESS: We at Texland have drilled other Strawn wells in the area, and we have DST data which indicates that when the, the Walter was drilled, and the data that we have there, it appears it was at virgin pressure. It showed no depletion. We were above the bubble point. There was -- we had a production of over 40,000 barrels above the bubble point, and that's where we were able to actually get the material balance honed in very well.

And then in the course of doing the modeling work, there was no evidence of any extraneous production when we did the history matches. We also, as I said, you can look at the, going to Exhibit 13, you can look at the accumulation to the east, and that accumulation was drilled earlier and actually depleted earlier.

We did an extensive study of the Buchanan and Rouehce to the west, and did a lot of modeling on that and

determined that that is a separate accumulation. So we feel very comfortable that it is a contained system, contained of these three producers.

EXAMINER McCLURE: Now, on your Bubba well -- forgive me, I don't have your well diagram in front of me right now, but are the perfs, are they pretty much throughout the entire zone or have you already squeezed off your top perf?

THE WITNESS: Well, if you actually look at Exhibit 14 which is the cross section, the Bubba well is the far right wellbore, and the perfs are actually marked in blue. This particular piece of software does a funny thing, it doesn't put them together very well. And you can see that the Bubba is open through that, through that entire section.

EXAMINER McCLURE: Is there any consideration that you could perhaps get more recovery from this well if you wouldn't squeeze the top perfs and install artificial lifts in it, or what's your thoughts on that.

THE WITNESS: If you look at the structure well, the structural map, you'll see the Bubba is essentially structurally the highest well. The permeability of this rock is in the tens of millidarcy range, and it appears, based upon the performance of the Bubba, that it actually encountered a secondary gas cap when it was drilled.

And so, therefore, we feel that the, you know, trying to artificially lift that -- and we have actually gone in and measured the bottom hole pressure, and we really don't see any significant fluid accumulation there.

EXAMINER McCLURE: I'm with you. Your original reservoir pressure, what was it actually at, and how high do you project during this waterflooding to bring your reservoir pressure back to?

THE WITNESS: I would have to look at my material balance calculation, if I may.

The, the original reservoir pressure was about 3600 pounds, and the bubble point, based upon the PVT data we have was 2,982. We are not planning on trying to go back to original pressure. We've already encountered all the shrinkage we are going to encounter.

EXAMINER McCLURE: You're just going to bring it back to bubble point? Is that your thought?

THE WITNESS: If I can do it at a lower pressure -- you know, the Walter is very -- is a very prolific producer. We are going to try to keep it pumped off. These wells are sumped, the ones that are on artificial lift.

So the idea is not to try to repressurize the reservoir other than this is a sweep, this is -- we're going for the sweep effect. Once we fill it up, we'll sweep out

the gas, and then it's going to be a -- to some degree there will be a lot of drag component to this.

EXAMINER McCLURE: Clearly you don't know until you do it, but what are you projecting your breakthrough time to be?

THE WITNESS: Three to four years is what we modeled.

EXAMINER McCLURE: That's not bad.

THE WITNESS: But that's based upon the injectivity of a maximum of about 2000 barrels a day per well initially, and then once we start getting fill up it will slow down.

EXAMINER McCLURE: You haven't conducted any injectivity in this well as of yet, I'm assuming, or am I wrong?

THE WITNESS: No, we have not. It's still permitted as a producer.

EXAMINER McCLURE: Yeah, I'm with you. As far as the water your sourcing, production water, where are you getting your waterflood water from?

THE WITNESS: Mr. Scott will testify to that.

EXAMINER McCLURE: Okay, fine.

THE WITNESS: But it will -- it is a -- it is an off-lease Abo well.

EXAMINER McCLURE: Okay. So currently you have

no h2s, and currently there is no h2s present in this Abo well; is that correct?

THE WITNESS: Like I said, I will defer to Mr. Scott on that.

EXAMINER McCLURE: I'm sorry, I will ask him those questions then. I believe that is all the questions I have for you today.

THE WITNESS: Okay. Thank you.

HEARING EXAMINER LOWE: Ms. Murphy?

EXAMINER MURPHY: No questions.

HEARING EXAMINER LOWE: Mr. Goetze?

EXAMINER GOETZE: No questions.

MR. AMES: No.

HEARING EXAMINER LOWE: I have, on your Exhibit 18, your simulator --

THE WITNESS: Yes.

HEARING EXAMINER LOWE: In order to simulate that, what variables did you use to simulate.

THE WITNESS: We -- we started off with a geological interpretation. We had the log data that we had. We actually had core data from an offset well which was within a mile of this reservoir, and we used that with a BK transform to generate the permeability distribution.

We took the digitized log data and ran it through a test removed statistical zonation program to cross

correlate zones between the individual wells and to figure out how many layers to use. And then we had PVT data from another Strawn well which we had drilled.

HEARING EXAMINER LOWE: And the result of the simulator that you used, are you pretty confident in what it gives you?

THE WITNESS: We had a very good -- about the only thing we could really match was the GOR trends.

HEARING EXAMINER LOWE: Okay.

THE WITNESS: And we had a very good match. We input -- we input the oil production data, and the simulator was able to produce the oil -- you know, this is one thing when you have the simulator, if you've got the wrong definition, it won't make the actual oil that you observe.

And then the independent variable that we were -- or the dependent variable we were using once we were able to match the oil, the dependent variable was the GOR, and we were able to match the gas trend very well.

So we felt that that -- and then tying it back to the material balance which would be an independent oil and place number validated that we had a good interpretation in the model.

HEARING EXAMINER LOWE: Thank you for that one. Also, in Exhibit 20, the last exhibit --

THE WITNESS: Yes, sir.

HEARING EXAMINER LOWE: -- explain to me what that 9 percent discount factor is.

THE WITNESS: That's the present worth of the cash flow over that 46 years.

HEARING EXAMINER LOWE: Okay.

THE WITNESS: So we do, you know, rate of return and present worth economics on this. And so, yes, the $9.1 million cash flow is the total value of the cash which would be realized by the integration of the curve under Exhibit 19.

And then if we actually discount that back to present time so we can compare it to the investment, that minus the investment would still give us right at $2.1 million value.

HEARING EXAMINER LOWE: Thank you for that. That's all the questions that I have. Thank you.

THE WITNESS: Okay.

MR. RANKIN: No further questions. Mr. Examiner, I would like to excuse Mr. Neuse and call our last witness, Mr. Clayton Scott.

HEARING EXAMINER LOWE: Mr. Neuse, you are excused.

CLAYTON SCOTT

(Sworn, testified as follows:)

DIRECT EXAMINATION

BY MR. RANKIN:

A. Good afternoon.

**Q. Good afternoon, Mr. Scott. Will you please state your full name for the record?**

A. Clayton William Scott.

**Q. By whom are you employed?**

A. Texland Petroleum LP.

**Q. What's your job with Texland?**

A. Operations engineer.

**Q. Have you previously testified before the Division?**

A. I have not.

**Q. Let's get you qualified as an expert.**

**Mr. Scott, will you please review for the Examiners your educational background and your relevant work experience as a petroleum and operations engineer.**

A. I have a BS in petroleum engineering from Texas A&M University. Received that in 2014. Went to work for Texland as a field engineer from 2014 to 2016. And then from 2016 to now I have been an operations engineer in our Ft. Worth office.

**Q. Are you familiar with the application that was**

**filed in this case?**

A. I am.

**Q. Are you familiar with the C-108 that was prepared as well?**

A. Yes.

**Q. In fact, you are the one that prepared that C-108; is that correct?**

A. I am.

**Q. And you are familiar with the engineering that supports the injection that's proposed in this case?**

A. I am.

**Q. Have you conducted an engineering study with the proposed injection well, the design operations wells within the half mile area of review surrounding the exterior boundaries of the proposed unit?**

A. I did.

MR. RANKIN: Mr. Examiner, at this time I would tender Mr. Scott as an expert in petroleum engineering.

HEARING EXAMINER LOWE: Petroleum engineering, he is so qualified.

MR. RANKIN: Thank you very much.

BY MR. RANKIN:

**Q. Mr. Scott, we discussed to some extent the proposed injection zone which would be within the Shipp Strawn pool within the Strawn formation. Can you tell us**

**what the proposed injection intervals will be based on the perfs in the Bubba 4 well. You are turning to Exhibit Number 7; is that correct?**

A. I am.

**Q. All right. I will let you get to that exhibit.**

**Mr. Scott, Exhibit Number 7 you're referring to is a copy of the C-108 that was prepared for the authorization to inject in this case?**

A. Yes.

**Q. Okay. And just identify, if you would, the, the injection interval within the proposed injection well.**

A. The injection interval in the Bubba, injection well will be 10,928 to 11,040 feet.

**Q. That's based on the perfs that are existing in that well?**

A. In the current perforations, and we have no plans of changing those at this time.

**Q. We'll talk a little bit more about the well construction in just a moment. Referencing the geology within your Exhibit 7, on Page 35 of that exhibit, this is information on the geology required by the C-108. And does this section here contain all the required information on the geology required under the C-108?**

A. Yes, it does.

**Q. Would you review for the Examiners what --**

**Mr. Lee testified to some extent -- a great extent about the geologic interval here. Will you review for the Examiners what the proposed injection zone is?**

A. The proposed injection zone is the Pennsylvania Strawn Limestone. Like I said, it's 10,928 feet down to 11,040 feet. The current perforation is in the Bubba producing well.

**Q. And you have, and Texland has available the geologic data on the Strawn formation in this area?**

A. Yes.

**Q. In your opinion, will the target formation be able to accept and contain the fluids injected for operations in this area?**

A. Yes.

**Q. And what formations, again, are going to be acting as a barrier to contain that injection from waterflooding?**

A. The Lower Strawn Shale will act as the upper barrier, and the Atoka Shell as the lower barrier.

**Q. Mr. Lee testified on the location of fresh water zones in the area. Will those barriers, in your opinion, operate as an effective barrier to contain the injection fluids from intermingling with the overlying fresh water zones?**

A. Yes, they will.

**Q. And there are no other fresh water zones below the injection area?**

A. There are not.

**Q. Are there any fresh water wells that you are able to identify within a one-mile area of the proposed injection?**

A. We located an agricultural well approximately a mile northeast.

**Q. And is that well identified on the State Engineers database for fresh water wells?**

A. It is not.

**Q. So you were able to find it outside of that fresh water database?**

A. Yes.

**Q. And is the sample -- did you get a test sample from that well?**

A. We did.

**Q. Is that on Page 36 of Exhibit 7?**

A. It is.

**Q. Do you actually have the coordinates for that well location?**

A. I do.

MR. RANKIN: And, Mr. Examiner, we can read that into the record or I can provide it to you by e-mail.

BY MR. RANKIN:

**Q. But for purposes of the record, Mr. Scott, will you identify the location by lat and long for the record?**

A. 32 degrees due -- 40.98 north, 130 degrees 1444.27 west. Those are 927 coordinates.

HEARING EXAMINER LOWE: Mr. Scott, if you don't mind, could you speak up a little louder.

THE WITNESS: Yes, sir. Do you want me to repeat the -- would you like me to repeat that location?

HEARING EXAMINER LOWE: I will be okay, but just for the future.

BY MR. RANKIN:

**Q. Now, in your opinion, based on your analysis, will the proposed injection threaten any sources of fresh water or drinking water in the area?**

A. No, sir.

**Q. What will the source of the injection fluids be here to sustain the waterflood operations?**

A. The source of injection fluids for make-up water will come from the Abo formation. That's a well located north of the proposed unit. It is a P and A well currently, and we will reenter the well and complete the Abo formation, that will be our source of make-up water.

**Q. Do you have a sample, a chemistry sample of the water that will be that source of water?**

A. Yes. Page 33 includes a sample from an offset

Abo water analysis.

**Q. And is that a full chemistry work-up of that source water?**

A. That is correct.

**Q. And you also have prepared a chemistry analysis of the receiving formation zone?**

A. Yes.

**Q. Is that on Page 34 of your Exhibit 7?**

A. Page 34 includes an offset Strawn water analysis we believe the water will be comparable to. The wells currently aren't making any water, so we use an offset well for the analysis.

**Q. You conducted a compatibility test to determine the compatibility of those fluids within the injection zone?**

A. Yes. Page 35 of Exhibit 7 details the compatibility and shows that the fluids are compatible.

**Q. Okay. So no issues with scaling or other compatibility problems or concerns with those fluids?**

A. Not at this time. If we do see -- you know, when we go in to reenter the well or to convert the Bubba to an injection well, if we see scale at that time, we'll -- we'll remove it via mechanical means or acid stimulations. And then down the road if we start to see scaling problems, we'll add a chemical treatment, or, if necessary, acid stimulations.

**Q. Okay. Now, let's talk about your area of review analysis. Mr. Woods testified that the area of review was the half mile offsetting the exterior boundaries. Is that the same area of review that you undertook for your engineering analysis?**

A. That is correct. That is shown on Page 12.

**Q. Okay. So if I flip to Page 12 on Exhibit 7 I will see a map that shows the area of review and the wells in that area?**

A. Page 13.

**Q. So Page 12, actually looking back, is a map that shows a larger scale. Review for the Examiners what that map on 12 shows.**

A. Page 12 shows the half mile radius along with a 2 mile radius around the proposed unit area.

**Q. So that shows, also shows all the wells within the radius?**

A. Yes.

**Q. The next page, 13, is the half mile area of review which is the basis for your engineering analysis?**

A. That is correct.

**Q. Okay. And that map shows all the wells existing in that area to date?**

A. Yes. It shows all the wells within a half mile area of review that have penetrated the proposed injection

zone.

**Q. And you have also prepared a table of data identifying the pertinent information for those wells?**

A. I have.

**Q. Is that on your next page?**

A. Page 14 and 15 is a table included of, I believe, 26 wells.

**Q. And identifies the current status of the wells, as well as the zone in which it is completed and other pertinent data?**

A. Yes.

**Q. Have you identified wells within the half mile area of review that have been P and A'd?**

A. Yes.

**Q. Do any of those P and A wells actually penetrate the injection area?**

A. Yes, 16 of them do.

**Q. Have you also then included a wellbore schematic for each of the P and A wells that penetrate the injection well?**

A. Yes, I have.

**Q. Do those schematics start on Page 16?**

A. Yes.

**Q. And, Mr. Scott, in your review, you looked at each of the wellbore schematics for each of these wells?**

A. I have.

**Q. Have you identified any issues or problems regarding their cement or plugs with respect to the proposed injection?**

A. I have not. Each one shows to be plugged sufficiently.

**Q. You have not identified any immediate remedial work that will be required in advance of waterflood operations to protect any other zones in this area?**

A. I have not.

**Q. Now, let's shift gears and talk about the proposed well for injection. If you would, is all the data required by the Division for approval on the proposed well contained in the C-108?**

A. Yes.

**Q. If you turn to Page 9 of, of Exhibit 7. Is this -- what does that page show? What does that wellbore schematic show?**

A. Page 9 is the current producing setup for the Bubba 4 State Number 1 Well.

**Q. This is not what you intend it to look like on injection; this is what it currently looks like as it's producing now?**

A. That is correct.

**Q. Do you also have a wellbore schematic for how you**

**intend to convert this well?**

A. Yes. Page 10 includes a wellbore -- proposed wellbore schematic for injection operations.

**Q. Will you review for the Examiners the salient points on your construction for this conversion to injection?**

A. Three string casing design well. Our plan is to pull the current 2 7/8 tubing out the hole. We'll run 2 3/8 internally plastic-coated tubing with an air set 1X packer, and we'll set -- planning on setting the packer around 10,828 feet. Cement top on the 5.5 string is at 2,590 feet, and that was determined via bond log on the initial completion.

**Q. In your opinion, is the current -- the proposed construction for this well, is it adequate to protect other zones, fresh water zones and other hydrocarbon-bearing zones from the impact during waterflood operations?**

A. It is.

**Q. Do you have any plan to stimulate the well before you inject?**

A. Not at this time. If we encounter scale issues once we reenter the well during the conversion process, then we may pump some type of acid stimulation.

**Q. Let's talk about your operational parameters. If you would, let's talk about the -- let's see where you've**

**got the operation parameters. What are your proposed injection rates and volumes for the well?**

A. Page 32 of Exhibit 7. Our proposed average daily rate Steve talked about earlier is 750 barrels a day. Our proposed maximum daily rate is 2000 barrels a day. And maximum volume to be injected into the Bubba 4 well is 10 million barrels. The average injection pressure, 1450 psi, with a maximum injection pressure of 1950 psi.

**Q. Based on those -- that maximum injection pressure is based on the Division's default guideline of .2 pounds per depth -- foot of depth down to the top of the uppermost injection perforation?**

A. That is correct.

**Q. And are those surface injection pressures sufficient to handle the rates that you are proposing to inject in the well?**

A. They are.

**Q. Now, how about monitoring the integrity of the well prior to injection, you'll run an MIT test?**

A. That's correct. When we set the packer, we'll start the packer fluid to prevent any corrosion within the casing. And then each the tubing anulus and each casing string anulus will be equipped with pressure gauges to be monitored.

**Q. So prior to injection you run an MIT, and during**

**injection you will be monitoring with the pressure with the packer fluid?**

A. That is correct.

**Q. And as far as you know, do you have any data on the integrity of the cement at this time in the well?**

A. Just via the well file since we didn't drill the well. It indicated that the top of cement via CBL was at 29 50. I believe it's 29 50. Let me check the number again. And they indicated it was a good cement bond to that top. It's 25 90.

**Q. And based on that, again you have no -- your opinion is that this well is adequately equipped for injection?**

A. Yes.

**Q. Okay. Now, Mr. Scott, in your opinion will the granting of this application and permitting Texland to inject waterflood operations through this well, the Bubba 4 State Com Number 1 will be in the interest of conservation, the prevention of waste, and protection of correlative rights?**

A. Yes.

MR. RANKIN: At this time, Mr. Examiner, I move the admission of Exhibit 7.

HEARING EXAMINER LOWE: Exhibit 7 will be accepted for the case.

(Exhibit 7 admitted.)

MR. RANKIN: Thank you very much. At this time I pass the witness for questions by the Division.

HEARING EXAMINER LOWE: Thank you. Mr. McClure?

EXAMINER McCLURE: I have a few questions for this witness. Is there any h2s or other corrosive gas present in the reservoir at this time.

THE WITNESS: I'm not sure on the h2s content. I believe it's low, if any.

EXAMINER McCLURE: But there is some h2s?

THE WITNESS: I'm not 100 percent sure. We can provide a gas analysis. I just can't think back on what it is.

EXAMINER McCLURE: Now, your source well, when it was producing was there a present -- I don't know if it was your well.

THE WITNESS: It wasn't our well.

EXAMINER McCLURE: So we don't actually know what could potentially be present in formation there then?

THE WITNESS: We do not.

EXAMINER McCLURE: Prior to injecting, would you be opposed to getting a -- I guess it's hard to get out of water. Let me back up a bit.

THE WITNESS: We will definitely get a new water analysis once we recomplete the well and get an up-to-date

compatibility study. We believe the waters will be similar to the Abo water analysis we provided because it is an offset well approximately three miles to the west, so it's not, not far away.

EXAMINER McCLURE: I got you. And if you do -- if when you do your water analysis you project that scaling could in fact occur, do you plan on injecting scale inhibitor at the initial time then?

THE WITNESS: Yes. Yes. If our scaling indexes are high enough, we will treat it either periodically or all the time with a scale inhibitor treatment.

EXAMINER McCLURE: Do you also plan on injecting biocide or oxygen scavenger in your water right now, or what's your thoughts towards that?

THE WITNESS: I'm not a -- probably the oxygen scavenger. I can get a -- I can follow up with exactly what we'll -- what we will be planning on pumping. Likely not biocide at this time.

EXAMINER McCLURE: Okay. I have no further questions for this witness. Thank you.

EXAMINER MURPHY: I have no questions.

HEARING EXAMINER LOWE: Mr. Goetze.

EXAMINER GOETZE: We need you to amend your C-108 a bit and supplement it with a statement from the witness here. I noticed in the affirmation statement, Page 37 of

the C-108, in the affirmation statement, the proposal well, the proposed well is not for disposal. We don't -- the affirmation statement has to be submitted and signed off on because whether it's injection for disposal or not, you make the statement it will not migrate, there are no hydrologic connections. So would you just provide, you've given it in testimony, let's reaffirm it with a submittal.

MR. RANKIN: Just to be clear. So my understanding was that only if it was for purposes of disposal that you provide the statement.

EXAMINER GOETZE: If you are injecting water and it comes up no matter what, then you invaded an underground source. It's required for all injection purposes.

MR. RANKIN: We'll submit --

EXAMINER GOETZE: That's fine, and that closes up the application then.

That's all. Thank you.

MR. AMES: None.

HEARING EXAMINER LOWE: I have no questions. Thank you.

MR. RANKIN: If no further questions, Mr. Examiner, I would move the -- request that this case be taken under advisement with the additional supplementation on the statement that we will provide forthwith. We ask this case be taken under advisement at this time.

HEARING EXAMINER LOWE: Did you tender everything?

MR. RANKIN: I think we did. Exhibit 7 was admitted, so we are complete. Thank you very much.

HEARING EXAMINER LOWE: Okay. Case Number 20894 will be taken under advisement.

We will take a 15-minute break. We will reconvene at 2:50.

(Case 20894 taken under advisement.)

STATE OF NEW MEXICO )
)SS
COUNTY OF SANTA FE )

I, IRENE DELGADO, certify that I reported the proceedings in the above-transcribed pages, that pages numbered 1 through 78 are a true and correct transcript of my stenographic notes and were reduced to typewritten transcript through Computer-Aided Transcription, and that on the date I reported these proceedings I was a New Mexico Certified Court Reporter.

Dated at Santa Fe, New Mexico, this 14th day of November 2019.

_____

Irene Delgado, NMCCR 253
Expires: 12-31-19