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 NOS: 21145

APPLICATION OF FOUNDATION ENERGY
MANAGEMENT, LLC, FOR APPROVAL OF A
SALT WATER DISPOSAL WELL,
LEA COUNTY, NEW MEXICO.

REPORTER'S TRANSCRIPT OF VIRTUAL PROCEEDINGS

EXAMINER HEARING

FEBRUARY 18, 2021

SANTA FE, NEW MEXICO

This matter came on for virtual hearing before the New Mexico Oil Conservation Division, HEARING OFFICER FELICIA ORTH and TECHNICAL EXAMINERS LEONARD LOWE and BAYLEN LAMKIN on February 18, 2021, as hosted by the New Mexico Energy, Minerals, and Natural Resources Department, Santa Fe, New Mexico.

Reported by: Irene Delgado, NMCCR 253
PAUL BACA PROFESSIONAL COURT REPORTERS
500 Fourth Street, NW, Suite 105
Albuquerque, NM 87102
505-843-9241

A P P E A R A N C E S

For the Applicant:

MANI, LITTLE & WORTMAN
PHILIP MANI
300 Throckmorton Street, Suite 530
Ft. Worth, TX 76102

For Devon Energy:

ADAM RANKIN
HOLLAND & HART
110 North Guadalupe, Suite 1
Santa Fe, NM 87501
505-954-7286

For the Oil Conservation Division:

ERIC AMES
ASSISTANT GENERAL COUNSEL
1220 South St. Francis Drive
Santa Fe, NM 87505

I N D E X

W I T N E S S E S

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

HEARING EXAMINER ORTH: So the last thing we have on the worksheet this morning is Case 21145. This is a salt water disposal well case. The well name is -- the applicant, excuse me, is Foundation Energy. The name of the well is Blooming Quail. Who is here for the applicant?

MR. MANI: Philip Mani with Mani, Little & Wortmann for Foundation Energy.

HEARING EXAMINER ORTH: Good morning, Mr. Mani. We also have entries of appearance for Devon Energy from Holland & Hart. Is that you, Mr. Rankin?

MR. RANKIN: Good morning, Madam Hearing Examiner. Adam Rankin appearing on behalf of Devon Energy with the law firm of Holland & Hart.

HEARING EXAMINER ORTH: Good morning. And the Oil Conservation Division? I see Mr. Ames.

MR. AMES: Good morning, Ms. Orth. Eric Ames for the Oil Conservation Division.

HEARING EXAMINER ORTH: Good morning. Are there any other entries this morning, anyone else who should be introduced?

(No audible response.)

HEARING EXAMINER ORTH: No? All right. So, again, this is a hearing -- let me ask if anyone needs a break before we dive into it. I have read the prehearing statements from each of the three parties and the witnesses'

testimony was submitted along with exhibits before this hearing.

Are there any preliminary matters or does anyone need a break before we leap into this?

MR. MANI: We are prepared to go, Madam Examiner.

HEARING EXAMINER ORTH: All right. Terrific. So if you would please, Mr. Mani, introduce your witnesses and I will swear them in.

MR. MANI: Yes. Our first witness is Thomas Lee Garvie, he will be expert in the area of land and land ownership. Second is Mr. Tyler Pansa, and he is the geologist. He will be the expert in geology. And finally Mr. Adam Johnson, and he is our petroleum engineer.

HEARING EXAMINER ORTH: All right.

If Mr. Garvie, Mr. Pansa and Mr. Johnson are all on, if you would please raise your right hands. Do you and each of you swear or affirm that the testimony you are about to give will be the truth, the whole truth, and nothing but the truth?

WITNESSES (Collectively): I do.

HEARING EXAMINER ORTH: Terrific. That was all three of you. Thank you. Go ahead, Mr. Mani.

MR. MANI: Madam Examiner, I didn't know whether or not we should go through the complete testimony for qualifying. We have submitted qualifications and direct

testimony. We think there were no objections to any of those, and in saving time, if we could stipulate to those, to those questions and answers and simply tender the witnesses as experts in their respective fields -- I'm not really sure of the procedures doing this, but I thought that may be more efficient.

HEARING EXAMINER ORTH: I think that's an excellent suggestion, Mr. Mani. Mr. Ames, do you have any objections to proceeding that way?

MR. AMES: No objection, and we would request the same courtesy of the other parties.

HEARING EXAMINER ORTH: Thank you. Mr. Rankin?

MR. RANKIN: Good morning, Madam Examiner, I was planning on doing exactly the same thing. And I think it would be most efficient if we could have the witnesses adopt their testimony and otherwise proceed to stipulate to their qualifications.

HEARING EXAMINER ORTH: Thank you very much. Terrific, Mr. Mani, please go ahead.

MR. MANI: All right. Mr. Garvie, I will begin with you.

THOMAS LEE GARVIE

(Sworn, testified as follows:)

DIRECT EXAMINATION

BY MR. MANI:

Q. The application is required to be served on the surface owners of the land which the well is located. Did you serve the application on the surface owner?

A. Yes.

Q. And the surface owner was the United States of America through the Bureau of Land Management?

A. Yes.

Q. And that was served on August 1, 2019, your Exhibit 1?

A. Yes.

Q. All right. Additionally the application is required to be served on each leasehold operator within a half mile of the well location. Did you serve the application on each leasehold operator?

A. Yes.

Q. And the leasehold operators are identified on a lease schedule, your Exhibit 2; is that correct?

A. Yes.

Q. And the operators were each served by certified mail, return receipt requested, which is your Exhibit 3; correct?

A. Yes. Yes.

Q. All right. The application is also required to be published in a newspaper in the county where the well is located. Did Foundation have notice of the application

published in Lea County?

A. Yes.

Q. And evidence of that is your Exhibit 4 where the application was published in the Lovington Leader on May 30, 2019; is that correct?

A. Yes.

Q. All right. All right. Mr. Garvie, what is Foundation's need for converting the Blue Quail Fed Number 1 or just the Blue Quail Fed Well into a salt water disposal well?

A. We need storage capacity from the production of offset wells.

Q. All right. Have you completed any, or re-completed any wells in the area, in the vicinity of the Blue Quail Fed Number 1, and are you looking for a need to dispose of salt water from that well?

A. Yes. We have completed the -- re-completed the Blue Quail Number 3. And we have currently a salt water disposal well right now, but it's nearing capacity.

Q. So which well is that?

A. That's the Bitsy Federal Number 1, I believe.

Q. Saltwater disposal well?

A. Yes.

Q. And does Foundation Energy plan to re-complete additional wells in the vicinity?

A. Yes.

Q. And the disposal, salt water disposal capacity that you mentioned earlier, that's the need for this application and to re-complete this well; is that correct?

A. Correct.

Q. All right. If the application is granted, Foundation's plans for this well, will it be a non-commercial salt water disposal well?

A. Yes.

Q. All right. Let's talk about the property where the Blue Quail Fed is located. The Blue Quail Fed salt water disposal well proposal is located in the area with other Foundation wells nearby; is that correct?

A. Yes.

Q. And are these wells connected through production pipelines? How are these wells connected, and what would your proposed method be for moving salt water from the other -- produced from the other wells to the disposal well?

A. Through existing flow lines.

Q. So there wouldn't be a need for a trucking -- for loading and trucking the salt water, it could simply be through the flow lines that are already existing?

A. I believe so. You may want to confirm that with Adam.

Q. All right. And in the event Foundation's application is denied how will that effect Foundation's proposed re-completion operations?

A. This will inhibit our ability to re-complete our offset production wells.

Q. How many wells is Foundation planning on re-completing.

A. Depending on the results moving forward, anywhere between four and five.

Q. Has Foundation considered disposing of produced salt water in any commercial disposal wells currently operating?

A. We have looked at alternatives, however, the economics don't make sense for us to do that.

Q. There's a nearby commercial salt water disposal well. Do you know the operator of that well?

A. I don't. I believe, Devon -- I believe it's Devon.

MR. MANI: At this point, Madam Examiner, we offer Exhibits 1 through 4 for acceptance as evidence.

HEARING EXAMINER ORTH: Objections from Mr. Rankin or Mr. Ames?

MR. AMES: No objection, Ms. Orth.

MR. RANKIN: No objection.

HEARING EXAMINER ORTH: Thank you, they are

admitted, Exhibits 1 through 4.

(Exhibits 1 through 4 admitted.)

HEARING EXAMINER ORTH: Mr. Mani, is the witness available for questioning?

MR. MANI: Yes, Madam Examiner.

HEARING EXAMINER ORTH: Thank you. Mr. Rankin, do you have questions of Mr. Garvie?

MR. RANKIN: Good morning, Madam Madam Hearing Officer I do have some questions for Mr. Garvie.

CROSS-EXAMINATION

BY MR. RANKIN:

Q. Good morning, Mr. Garvie.

A. Good morning.

Q. Are you able to hear me all right?

A. Yes, sir.

Q. Let me know if you have a problem hearing. I know sometimes with Webex format is a little bit clunky and sometimes has technical issues, so let me know if you need me to repeat or if you didn't here me clearly. Okay?

A. Yes, sir.

Q. I just want to make sure I understood, because I was a little confused when I was reading through your direct written testimony about the surface owner. I understood you to say that the BLM is the surface owner?

A. Correct.

Q. Okay. Is, is the State Land Office an owner as well of the surface or of any of the offsetting the acreage?

A. I would have to confirm that.

Q. Okay. So you provided notice to the State Land Office, but you are not sure what or not they are an interest owner or why they got notice?

A. I would have to revisit the title, but yes, we noticed them, and we believe that they're a party, too.

Q. You believe they are what?

A. A party to the mineral interest and surface.

Q. Okay. Now, as to the BLM, they are the owner of the surface and the mineral in the tract where the proposed injection well is located; is that right?

A. Correct.

Q. And what's the status of Foundation's efforts to obtain authorization from the BLM to inject? Have you approached the BLM or sought authorization to inject produced water through that well at this point?

A. No.

Q. You have had no discussions or made no effort to engage the BLM for authorization?

A. I believe we are waiting to get the authorization from the NMOCD first.

Q. Now, on the Bitsy, your current injection well that you're -- that Foundation is operating right now,

that's -- to your knowledge, has the Bitsy disposed or injected for disposal purposes into any other zone or formation other than its current injection zone?

A. I don't believe so. That would be a question that's best suited for either Adam or Tyler.

Q. Okay. Now, on your direct testimony -- I think you covered this a little bit in your summary, but I understood that, that Foundation's wells were set up with flow lines connected to the Bitsy disposal well; is that correct?

A. To my knowledge, yes.

Q. Okay. So the Bitsy is currently, is the Bitsy currently the only disposal well that's being operated by Foundation in New Mexico?

A. I don't -- that's a good question. I would have to do some research on that.

Q. Okay. How about this: As far as the wells within the vicinity of Section 7, is the Bitsy the only well, injection well that's being operated by Foundation?

A. Yes.

Q. Does the Bitsy have other surface facilities at the Bitsy well that are currently set up for handling Foundation's disposal operations?

A. Again, that would be a question better suited for Adam or Tyler.

Q. Okay. So you're not exactly sure how the Bitsy is currently set up or how other wells are providing produced water or connected to the Bitsy?

A. Correct.

Q. Okay. I will try to get those from Mr. Pansa or Mr. Johnson. Mr. Garvie, do you know what Foundation's plans are for the Bitsy once -- assuming Foundation obtains authorization to convert the Blue Quail 1 to injection, do you know what Foundation's plans are for operating the Bitsy, assuming that's the case and you are able to initiate injection into the Blue Quail well?

A. That would be, again, a question for Adam.

Q. Okay. Do you know whether or not Foundation investigated or evaluated whether the Bitsy could be converted to a Bell Canyon injection well?

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

Q. Okay. So you don't know whether or not Foundation has evaluated the prospect of injecting into the Bell Canyon through the Bitsy, that's something that, to your knowledge, has come up or been discussed with your company?

A. It probably has been. But again I'm going to divert that question to Adam.

Q. Very good. Mr. Garvie, you know, you discussed the distinction here where Foundation is not seeking a -- to

use this well for commercial purposes, in other words, my understanding would be that Foundation is not going to be accepting water from any other entities other than water from Foundation's own existing wells. Is that correct?

A. Correct.

Q. And you agree that the Oil Conservation Division does not distinguish in its application forms or regulations between a salt water disposal well that's intended to be operated for commercial or non-commercial purposes?

A. Yes.

Q. Do you know -- and this may be a question, you know, based on -- I know it may not be your expertise, but do you know what the anticipated life of injection is into the Blue Quail 1?

A. I don't.

Q. Okay. Now, Mr. Garvie, have you had a chance to review the Oil Conservation Division's -- and I may be -- I'm only asking this because I want to make sure the question is asked, and I may be taking some of the questions from Mr. Ames, but I want to make sure the questions are addressed. Have you had a chance to review the Division's prehearing statement that was filed in this case?

A. I'm sorry, can you repeat the question?

Q. Sure. Did you have a chance to review the

Division's prehearing statement that was filed in this case?

A. I have not.

Q. So are you familiar with the Division's proposed conditions of approval should the Division grant authority to Foundation?

A. I have not seen it.

Q. Mr. Garvie, I'm going to share my screen. If I have --

A. I'm just connected through a cell phone.

Q. Oh, okay. So I couldn't even show you the conditions of approval that the Division has proposed if I wanted to, could I?

Let me ask you this, I can read them to you. While we are reading, Mr. Mani can tell me whether or not any of the other witnesses are familiar with the conditions.

A. (Unclear) because if that's the case, then yes, I have seen those.

Q. Can you restate that again?

A. Is it the. Hang on, I'm trying to pull up an e-mail right now. I'm a little confused as to what we are exactly talking about.

Q. Sure. There were eight conditions.

A. Yes. Yes. I am familiar with those. My apologies.

Q. That's okay. Now, you reviewed those eight

conditions. Does Foundation have any concerns or objections to any of those eight conditions that are being proposed by the Division should Foundation be authorized to inject through the proposed well?

A. I believe it was one objection, and it was Number 8, and I'm going to kind of defer that objection to the experts being Tyler and Adam.

Q. So as to the other provisions, each of the other seven provisions, Foundation doesn't have any objections and those conditions are acceptable to Foundation?

A. To my knowledge, yes.

Q. Okay. And Mr. Johnson will be able to answer the question about Foundation's concerns about Condition Number 8?

A. Yes.

Q. Now, Mr. Garvie, we talked about Foundation's plans to re-complete the offsetting wells. I just want to make sure I understand because I'm a little confused by the exhibits that are filed and there is written testimony and then your summary, I'm a little confused by how many wells Foundation is actually proposing to re-complete. So I just want to walk through that with you, okay?

A. Sure.

Q. My understanding is that Foundation had so far re-completed one well, which is the Blue Quail 3; is that

correct?

A. Yes.

Q. In what zone did Foundation re-complete that well?

A. I am going to defer to Tyler.

Q. But do you know generally if it was the Cherry Canyon or the Brushy Canyon or some combination of those two?

A. Again, I'm going to defer to Tyler.

Q. Tyler, okay. Do you know, Mr. Garvie -- now, in the written testimony there is some discussion about maybe six or seven wells being re-completed in addition to the Blue Quail. And I heard you -- and then among the exhibits it looked like there may be as many as ten wells planned for re-completion. And then on your summary I heard you say four to five wells are going to be re-completed in addition to the Blue Quail. So I'm hearing the numbers go from ten down to four or five now, and I'm wondering if you could tell me what is the -- what are the plans and how many wells Foundation is going to re-complete.

A. Well, it all depends on the success factor of each re-completion. So I kind of picked a conservative number, arbitrary number. Depending on the results it could be as many I guess possibly ten if it's successful. Again, you would have to talk to Tyler and Adam in regards to those

development plans. But, again, I -- my direct testimony, I was just kind of more or less plugging in a conservative number.

Q. Okay. Now, does Foundation -- Foundation's operations in New Mexico, is it focused on re-completions only?

A. I mean, you know, a potential for an offset spud, you know, we would consider anything, really. But right now, yes, it's just really kind of explore and develop the existing production under our current model.

Q. So has Foundation drilled any wells in New Mexico to this point?

A. Is there a certain time frame, or just in total?

Q. Well, in total, let's start there.

A. I believe -- I don't know.

Q. Okay. How about in the last ten years?

A. Again, I have only been with the company for two and a half years, so I'm not aware any recent drills that we participated in. I am aware of just the re-completion efforts that we have obtained so far.

Q. I'm not talking about whether or not Foundation participated in a new drill, I'm talking about whether or not Foundation itself was the operator of a new --

A. Correct.

Q. Okay. Okay. Now does -- so going back in time

you are not sure, but at least Foundation has not drilled any wells in New Mexico that you're aware of?

A. Correct.

Q. How about going forward, does Foundation have any specific plans to drill any wells going forward?

A. Again, it just kind of depends. It's kind of an open-ended question. I mean if there is an opportunity to something that we see, then, yeah, there might be a possibility.

Q. I was actually asking if there is specific plans to drill right now. Not what might come up, but right now there is no specific plans to drill; right?

A. No.

Q. Okay. On the re-completions that Foundation is proposing, in your direct testimony, as I understood, there are two re-completion applications that are pending before the Oil Conservation Division; is that right?

A. Correct.

Q. Do you know for which two wells those are pending?

A. One second. I'm going to defer.

Q. Okay. To?

A. Tyler and Adam. You guys forgive me -- I'm not -- there was an area that I was managing as a regional landman, and I have been more or less transferred to another

area of our operations, and so my direct knowledge of upcoming re-completions isn't up to, up to par. I'd have to revisit exactly which wells those are that we have or not in the pipe.

Q. Okay. So at this point with those two wells -- let me ask you this then, if you can answer, if not, I will have to try to defer my question to one of the other two witnesses. So at this point, with those two re-completions, do you know whether Foundation -- that are pending before the Division -- do you know whether Foundation has -- does Foundation have partners in those wells that have been proposed for re-completion?

A. I would have to check. I would have to see our decks on those two wells.

Q. Okay. So do you know whether Foundation has issued AFEs for the costs to any partners for those proposed re-completions?

A. I don't know.

Q. Okay. Do you know if those re-completions, once approved, if they have a specific schedule they plan to be drilled or rather recompleted in 2021?

A. You know, I think it's all kind of dependent on our ability to get the Number 1 well converted into a disposal well.

Q. Okay. So you are waiting, in other words,

Foundation may be waiting to proceed with its budgeting and planning pending approval of it's injection authority?

A. Correct.

Q. Okay. But you don't know -- it sounds like you don't really know what contacts or efforts have been made to actually plan or budget or allocate funds with any partners or within Foundation for the two re-completion applications that are pending with the Division at this point?

A. Yeah, again, that would be a better question for Adam and Tyler.

Q. Okay. Do you know, Mr. Garvie, if there are any rigs or contractors for -- does Foundation have any rigs scheduled or under contract for re-completions in this area?

A. No. Not right now.

Q. Okay. Do you know, Mr. Garvie, whether Foundation itself has budgeted any money for preparing these re-completions in 2021?

A. Yes. I can say that with certainty that we certainly have looked at that.

Q. You have looked at it, but have you actually budgeted money to complete these re-completions during this year?

A. Again, I would assume, yes, but that would be probably be a question better suited for Adam and Tyler.

Q. Okay. And then this may also be -- but you did

mention it, so in terms of whether -- deciding whether Foundation proceeds with additional re-completions or not, or how many it does, what are the factors -- do you know what factors Foundation is going to be looking at to make that determination?

A. Before they re-complete additional wells?

Q. Yes.

A. I think the biggest one is being able to make sure we have the storage capacity for our produced water.

Q. Okay. Now, talking about storage capacity, in your direct testimony you discussed some discussions with Devon about its offset injection well.

A. Correct.

Q. That the negotiations terminated because it was uneconomic for Foundation. Is that a fair characterization?

A. Yes.

Q. Did Foundation make a counter-offer that would be economic to Foundation?

A. Did Devon make a counter-offer?

Q. No. Did Foundation make a counter-offer to Devon that would have been economic for Foundation?

A. Well, I believe -- yeah, I believe we did. I would have to revisit some of my earlier e-mails back and forth between Devon. At the time I believe I was talking with Katie Dean, and I can't remember exactly off the top of

my head what the actual circumstance was, but I do recall that, you know, at the end of the day, we weren't able to make a deal because we couldn't agree to a fair price, in our opinion.

Q. Okay. I think, Mr. Garvie, I don't -- I don't think I have any further questions for you at this time. I appreciate your cooperation.

MR. RANKIN: And, Madam Hearing Officer, at this time I pass the witness.

HEARING EXAMINER ORTH: Thank you, Mr. Rankin. Mr. Ames, do you have questions of Mr. Garvie.

MR. AMES: I do not, Ms. Orth. Thank you.

HEARING EXAMINER ORTH: Thank you. Mr. Lamkin, do you have questions of Mr. Garvie?

(No audible response.)

HEARING EXAMINER ORTH: Mr. Lamkin?

(No audible response.)

HEARING EXAMINER ORTH: No? All right. He may have stepped away. In that case, Mr. Mani, do you have any follow up with Mr. Garvie?

MR. MANI: No, Madam Examiner.

HEARING EXAMINER ORTH: Let's excuse Mr. Garvie then. The court reporter and I have been on since 8. Let's take a ten-minute break before you call your next witness. Thank you.

(Recess taken.)

HEARING EXAMINER ORTH: All right. Let's come back from the break, please. Mr. Mani, who is your next witness?

MR. MANI: Next witness is Mr. Tyler Pansa.

HEARING EXAMINER ORTH: All right. Thank you, Mr. Pansa. Good morning, you have already been sworn. Please go ahead, Mr. Mani.

TYLER PANSA

(Sworn, testified as follows:)

DIRECT EXAMINATION

BY MR. MANI:

Q. Mr. Pansa, What is Foundation's need for converting the Blue Quail Fed Number 1 into a salt water disposal well?

A. We will need water injection capacity for the further re-completions that we have planned in the field.

Q. And the further re-completions, are they to exploit the reserves potentially behind pipe in the Brushy Canyon, Cherry Canyon formations?

A. Yes, they are.

Q. Okay. And the additional capacity the Blue Quail Fed would provide, is it likely that Foundation would be able to re-complete or not re-complete a number of these wells?

A. We expect 300 to 500 barrels of water per re-completion IPs. So that would give us three -- the OCD's limit of 1000 barrels a day would give us three additional re-completions and more if we stagger them a bit because those wells will begin making less, so upwards of five or six re-completions would be possible over the next couple of years with 1000 barrels capacity.

Q. And, and in doing the re-completions, Foundation will be able to gain additional recoverable reserves?

A. That's correct.

Q. And what is the, what is your estimate of the recoverable reserves?

A. We expect -- yeah, we are expecting about 250,000 barrels total from all the re-completions.

Q. Okay. And not being able to re-complete the well wells, those reserves would be stranded; is that correct?

A. That's correct.

Q. Is there any production from the Bell Canyon formation within the area of review?

A. No.

Q. All right. And did you also look beyond the area of review to some extent as well?

A. Yes. I looked three to five miles in every direction.

Q. And was there any Bell Canyon formation

production within that additional area?

A. I didn't find any reported production from the Bell.

Q. What have you -- what have you researched, reviewed and examined regarding the Bell Canyon formation -- this is kind of a long question -- with regard to its geologic setting, its stratigraphy and structure, the porosity and permeability, and what are your conclusions?

A. I mapped the structure of the formation and the isopach thickness of the formation. I have also mapped individual sands and sub stone layers in between the sands. I found those to be continuous, continuous permeability barriers throughout the section in a mile radius of where we intend to inject.

I have done analysis on the well logs of porosity and resistivity, and also looked at offset CMR logs which are direct measurement of permeability to, to notice the difference in permeability between the injection sands and the confining sub stones.

Q. In your review of the structure, were you able to determine whether or not any faulting exists in the area of review?

A. There was no evidence of any faults. The structure was relatively smooth. There was nothing unusual that showed up in the well control (unclear).

Q. And is that strictly the Bell Canyon formation or the Delaware Mountain Group itself?

A. In all three formations. I have mapped the Brushy Canyon, as well as the other members of that formation and there doesn't appear to be any faulting.

Q. All right. The Bell Canyon formation, in your testimony, you have that it includes about 140 feet of sand. What is the porosity and permeability with regard to that section of sand?

A. The porosity of the sand is about 22 percent, and the permeability averaged around 50 millidarcies.

Q. All right. And directly above the Bell Canyon formation, the proposed injection interval, what is the formation above it?

A. Yes, there is some limestone and shale that constitutes the Lamar formation for about 50 feet or so, and above that is the Castile anhydrites. Both of those zones are impermeable and provides the seal or provide, I guess, an impermeable layer to restrict the liquid from traveling upwards.

Q. And then below the Bell Canyon formation, what are your findings with the same regard?

A. Yes. Well, taken as a whole, the rest of the Delaware Mountain Group, I mapped about, I think it was 15 to 20 zones of low permeability that would restrict water

flow, and those were totaling 122 feet. Most nearest the injection zone I mapped and created a cross section for three impermeable siltstones that totaled 25 to 35 feet in thickness and that they were continuous. I was able to correlate and map those across a large area.

They are deposited, in between turbidite flows, there is a settle -- deposit by the settling of finer grain sediments and their permeabilities as shown on the Sharbro 10 CMR log are less than 0.2 millidarcies. So a full, a full order of magnitude less than the permeability of the sands that we are putting the water into.

Q. So with regard to Foundation's proposed injection, what do you anticipate the behavior of the injected fluids would be within the Bell Canyon? Would you expect them to migrate horizontally or laterally or vertically or both?

A. I would expect them to stay within the sands that we are injecting them in, that they would be prevented from migrating vertically by the low permeability siltstones below and by the Lamar and Castile above. And I would not expect them to exit the zones laterally either due to the continuity of the below-perm barriers in the Bell Canyon below the injection sands.

Q. And the maps you have created, the cross sections you have put together, those are included in your Exhibits 8

and 10 for the -- in this application?

A. I have not seen how the exhibits have been numbered. I can tell you the name of the attachments that I sent them to you as, if that's helpful.

Q. All right. The Exhibit 8 is a PowerPoint which contains 18 separate slides. And Exhibit 10 includes the the Geoframe Processed Interpretation of logs?

A. Okay, then yes.

Q. And I apologize, I should have asked whether or not that included Exhibits 5, 8 and 10. 5 is the 18 slide PowerPoint that you submitted. All right.

A. Yes. Those are, those maps and cross sections are detailed in those exhibits.

Q. Okay. What are your findings regarding the rock characteristics and geology of the Bell Canyon injection zone laterally from the proposed injection well?

A. The injection sands are fine grain turbiditic deposits that are regionally wide spread, and they are bounded by siltstone deposits from 5 to 15 feet thick that -- that isolate those sands from each other.

Q. Are these readily correlatable laterally away from the proposed injection well?

A. They are, and my cross section and maps of those show that.

Q. All right. Combining that stratigraphy, the

porosity you mentioned and permeability parameters, what is your opinion about the Bell Canyon formation's ability to accept injected salt water?

A. It should take water readily at low pressure due to it's high porosity of 22 percent and relatively high permeability of 10 to 100 millidarcies.

Q. And when you mentioned low pressure, what is that in, in specific regard to? Is that with respect to water pressure which would fracture or which would not fracture the formation itself?

A. We would be injecting well below the fracture gradient of the formation, and you know, per OCD guidelines I think it was 940 psi or something like that as a maximum.

Q. Have you been able to review the injection data for the Bitsy salt water disposal well nearby?

A. I have.

Q. And what, what formation is the injection zone in the Bitsy?

A. The majority of the water has been put into the Cherry Canyon, a member of the Delaware group. And then in the recent last couple of years were re-completed up into the lower sands of the Bell Canyon formation.

Q. All right. And then the water that's going to be -- proposed to be disposed of in the Blue Quail, where is that water source from? Where is it produced from? What

formations?

A. It will be produced from the Brushy Canyon and Cherry Canyon.

Q. All right. Regarding the composition of the produced water, its salinity, viscosity, et cetera, are you aware of any conditions of the produced water which will be disposed into the Bell Canyon which could affect the integrity of the Bell Canyon formation?

A. No.

Q. Do you see any substantial difference in salinity or viscosity between what clearly exists in the Bell Canyon and the water that would be injected into it?

A. There is nothing suggesting such on the logs.

Q. All right. Let's talk about Foundation's proposed operations in the area. Foundation has re-completed one well and is producing some salt water, but what are Foundation's further development plans generally?

A. We have two more re-completions that we have approved AFEs for. We have a hundred percent working interest on those wells, so we do not need the approval of other operators, and those are planned for this summer pending our ability to inject water -- to dispose of the water that they would produce, and then we have another four or five planned re-completions for when -- when for later after that pending the success and the ability to dispose,

the room to dispose of the water.

Q. So if Foundation is limited to the one existing disposal well, would that limit the number of re-completions, potential re-completions Foundation Energy would undertake?

A. It would. I believe we would only do one of the, of the six if we did not have additional disposal in addition to the Bitsy.

Q. For the produced salt water, how is the produced salt water currently being disposed of, and what would your proposed method of transporting and disposing the salt water be for the Blue Quail Fed?

A. It's currently being disposed -- there is pipelines running to Bitsy from our wells that makes significant water, and we would also run lines to the Blue Quail 1.

Q. And approximately how much oil would be recoverable with all of your proposed re-completions -- re-completes and operations are approved including your ability to convert the Blue Quail Fed into a salt water disposal well?

A. About 250,000 barrels.

Q. And how would you -- how would you anticipate that would be developed and produced? Would it be primarily through the first few number of wells or evenly disbursed

amount of production over all of the re-completions?

A. Well, if I am a doing a good job we will start with the best ones. So I would anticipate that the, probably the first four would make, would make a majority of the oil, maybe 180,000 barrels. And then the next three would make the remaining 70,000.

Q. And your anticipated oil-water ratios between those first few wells compared to maybe the last few or subsequent re-completions?

A. I would expect upwards of ten percent oil cuts on the first, the first couple and perhaps between five and ten pointers oil cuts on the rest of them.

Q. You had a chance to review the testimony that Devon's geologist has submitted, direct testimony; is that correct?

A. That's correct.

Q. And with regard to some of the factual points, what -- what do you think are the top two or three points you would like to make with your geologic research and testimony compared to, to theirs.

A. Okay. I certainly disagree with the statement that water just -- the fluids just communicate freely throughout the entire Delaware Mountain Group. The siltstone layers are considerably lower permeability than the sandstone layers, so those will prevent flow from one

sand to another.

The fact that over 200 different reservoirs, different oil reservoirs have been discovered within the Delaware Mountain Group, that confirms that those siltstone layers do indeed act as confining, confining layers because they have been able to trap hydrocarbons for millions of years. And so there is no reason that our injected water would leave the zones that we are injecting it into when that, when that oil has been kept in the Brushy Canyon and Cherry Canyon by these siltstones layers that are the trapping mechanisms.

Also, we -- when we re-completed the Blue Quail 1, we found that pressure to be at around 1900 psi from some oil zones that had been depleted in some offset wells, and that puts that at about 60 percent or 70 percent of the hydrostatic pressure of those zones.

And so that also confirms that water is not just -- the fluid is not just communicating freely across the siltstone layers because we have been able to pressure deplete the produced zones, and they have not been flooded by the offset sands, the sands above, immediately above and below them.

Additionally, evidence that the siltstones are confining layers and that water should not make its way freely up and down through the stratigraphy of the Delaware

and certainly not all the way to Devon's Bone Spring, which they suggested as a possibility is we have Avalon production in the, vertical Avalon production wells and the Avalon is the uppermost member of the Bone Springs.

We have vertical producers from that formation in the section in question, and those wells have declined normally without any evidence of water influx from our current and past injection in the Cherry Canyon through the Bitsy.

I have those on that larger PowerPoint, I have those on slide six and seven showing how those wells make less than a barrel of water per day, and there's not been any water influx from our injection so far. And so there is no evidence that water injected even further away from the Bone Springs will have any chance of making it down into the Bone Springs intervals in this section.

Q. With regard to concern for protecting the shallower fresh water acquifer surface water and shallower formations, you had mentioned some seals. Can you follow up on that or reiterate your geology findings for the seals above the Bell Canyon?

A. Yes. The Lamar is a mixture of tight limestone and shale, and that would be a confining layer. And then immediately above the Lamar is the Castile anhydrite which is another impermeable confining layer.

And then after a little bit of the Castile is the intermediate casing that's set in all the wells out here to cover those anhydrites. So there is ample, ample isolation from fresh water, from shallow fresh water zones.

Q. So based on the information and data you have reviewed, do you find any geological evidence of hydrologic connection between the Bell Canyon formation disposal zone which is proposed and underground sources of drinking water?

A. I do not.

Q. And then based on the same information and data, do you find any geological evidence of hydrologic connection between the Bell Canyon formation proposed disposal zone and deeper geologic formations which are either productive or currently producing hydrocarbons or potentially productive?

A. I do not.

Q. All right. If, if the application is granted, just remind me how many additional re-completions may result?

A. I would expect we would do five additional re-completions.

Q. And if the application is denied, how will that affect Foundation's proposed development plans?

A. We will not be able to do those re-completions because they will not be economic.

MR. MANI: At this time we would like to offer

Exhibits 5, 8, 9 and 10 for acceptance.

HEARING EXAMINER ORTH: Let me pause for a moment in the event there are objection from Mr. Rankin or Mr. Ames.

(No audible response.)

HEARING EXAMINER ORTH: Exhibits 5, 6 -- no, sorry -- 5, 8, 9 and 10.

MR. MANI: Yes, 5, 8, 9 and 10.

HEARING EXAMINER ORTH: 5, 8, 9 and 10. 5 was the PowerPoint, 8 was the log for the Blue Quail well, 9 was the drilling report for the Trapper Well and Blue Quail Well and 10 was the Geoframe, the well Geoframe Interpretation.

(No audible response.)

HEARING EXAMINER ORTH: I don't hear any objections, Exhibits 5, 8, 9 and 10 are admitted.

(Exhibits 5, 8, 9, 10 admitted.)

MR. MANI: I will pass the witness.

HEARING EXAMINER ORTH: Thank you, Mr. Mani. Mr. Rankin, do you have questions of Mr. Pansa?

CROSS-EXAMINATION

BY MR. RANKIN:

Q. Good afternoon, Mr. Pansa.

A. Hello.

Q. Let's see. I do have some questions Mr. Pansa. I'm going to try to remind myself of the questions that were

deferred from Mr. Garvie and make sure I capture those as well.

A. Yes, sir.

Q. So let's see, on the -- on the stratigraphic intervals of low permeability, is it your opinion those barriers will protect production in the Brushy and Cherry Canyon, in your opinion?

A. Yes.

Q. And in your opinion, will those low permeability zones effectively contain the injection within the Bell Canyon, the proposed injection zone?

A. Yes.

Q. Now, let's see. I want to -- I think -- I'm going to see if I can share my screen.

MR. RANKIN: And I can't remember who my host is, Madam Hearing Officer.

HEARING EXAMINER ORTH: It's me, Mr. Rankin, make you presenter. Yes. You should have it now.

MR. RANKIN: Okay, thank you.

Q. Mr. Pansa, I'm going to start off by sharing, I think, Page 6 of your Exhibit 5 which is part of your PowerPoint. Can you see that on your screen?

A. Yes.

Q. And I think this is a copy of the portion of the production reports for the Sharbro Federal 10 wells which is

offsetting to the Bitsy Federal 1 SWD injection that's operated by Foundation; correct?

A. Correct.

Q. And I believe I understood you to testify that the Sharbro and the other well that's on the next Page 7 of the exhibit, has produced on average about less than a barrel of water a day; correct?

A. Correct.

Q. But it appears to me there is a significant spike in this Sharbro Federal 10 well in 2019 where the volume of produced water on your log rhythmic scale jumps significantly in 2019. Do you see that?

A. Yes.

Q. And there was a -- if you go to the OCD website and you break out that 2019 production year for water, you will see there is two months with very high volumes of water. Are you familiar with what I'm talking about?

A. I'm familiar with the chart -- oh, I see it on the side, yes.

Q. So in 2019, at least on your exhibit, it shows there was 2,258 barrels produced in 2019; correct?

A. Correct.

Q. And that's more than a barrel a day of water being produced, isn't it? It's a significant jump between prior years and 2019 on your chart?

A. That is. We believe that to be a misallocation. That well is on battery with the Blue Quail, Blue Quail Number 3, I believe. And so when we re-completed that well, they -- the allocations ended up wrong. We filed -- we filed with the state to have that amended, but I am not sure if that's been corrected or not.

This chart is from quite some many months ago before we noticed that, that issue. But that well is, the Sharbro 10 is not connected by pipeline. We truck the water away, so I, I -- we know that that water -- there was not really that much water there.

That was a -- you see how the oil goes up significantly toward the end of that, that was misallocated production from the other well on that battery. There has not -- there has not been a physical influx of water on that well in the field.

Q. So if I -- let me know if you see my screen switch. Can you see the OCD chart here from the website?

A. I cannot.

Q. I think I have to switch my actual screen, so one moment. I have to go to a new screen, one moment. Mr. Pansa, can you not see the screen that I'm sharing when it's switching to the OCD website for the Sharbro Federal Ten well?

A. Still not.

Q. Oh, because I haven't selected it yet. There we go.

A. Now, yes.

Q. Okay, great. So this is the Sharbro Federal Number 10 well. Do you agree?

A. Yes.

Q. Okay. I'm going to scroll down. And if you look at the -- I'm going to go down to the production numbers for this well, you see that -- do you see -- if it's too small to read or are you able to read those numbers?

A. I will lean in and working on it.

Q. I can do my best to increase the size a little bit.

A. That's great.

Q. Okay. So these are the production volumes reported by Foundation for this well starting 2011. You see the barrels of water are consistently, you know, in the range of 50 to 200 or so all the way up to 2019, and then you will see in 2019 you will see a huge spike. It's up to 7714 barrels of water for that year, and you are saying that was due to a misallocation of water production to this well for the month of August and September?

A. Yes. That's what I was told when I asked our field guys about it.

Q. Okay. And Foundation has submitted a correction,

but it hasn't -- you believe Foundation has submitted a correction that reflects the correct allocation of -- is it -- of the water production for this well?

A. Yes, I believe so.

Q. Is it just for the water and not for any of the other components of production, water or gas?

A. It was for oil as well, I believe, especially on those final months where the oil spiked up be that Sharbro 10, that was not a -- that spike was actually production from the Blue Quail 1 -- not the Blue Quail 1 -- the Blue Quail 3 that we re-completed. So I requested that it be amended for both to cover that spike in oil and the spike in water.

Q. I don't see a spike in the oil anywhere in 2019. Can you point to me where there was a spike in the oil production that hasn't been corrected yet?

A. I think it's in -- it would have been in 2020. Maybe it's been corrected. Let me see. On the chart there was a month where spiked up pretty high, so maybe it got partially corrected, and I hadn't followed up to see if the correction had been done or not.

Q. Okay. So your understanding was though the spike in production for oil, there was a different spike in water in 2019, and both of those would be corrected separately?

A. That's correct.

Q. Okay. Okay. What zone is the Sharbro Fed 10 producing from?

A. It's producing from Avalon Sand at the top of the Bone Springs.

Q. So that's the zone that should be protected against water intrusions from the injection that would be in the Bitsy based on those low permeable strata. Is that your testimony?

A. Yes.

Q. Now, I wanted to just -- this is just for purposes of clarifying, but I think I kind of put the dots together, but I want to make sure I understand it. Your testimony is that the source of water that's going to be injected into the Blue Quail 1 is going to be Brushy Canyon and Cherry Canyon source water; correct?

A. Correct.

Q. But the C-108 that Foundation submitted includes wells that are currently producing water from the Bone Spring Sand Dune pool; is that right?

A. No. I said that the water -- the Avalon wells do not produce water.

Q. Okay. So there is no water out there. And then this just connecting the dots. The re-completions that you are proposing and planning will be the source of this water being injected, those re-completions are going to be into

what formation?

A. The Brushy Canyon and Cherry Canyon.

Q. I just want to make sure I got that right, okay. And then the water samples that you submitted with your C-108, those water samples were from the existing zones in which those wells are currently producing water; correct?

A. Correct.

Q. So they haven't been re-completed yet; correct?

A. Most of them are already producing from some of the Brushy Canyon zones.

Q. I gotcha. I just wanted to make sure I understood it. And then what two wells have been submitted for approval for re-completion authority?

A. It's the Sharbro Fed 6 and Sharbro Fed 4.

Q. And the wells that -- the wells that Foundation is proposing to re-complete, are they all the wells that are identified in the C-108 as source water wells?

A. I'm not sure. What is the C-108?

Q. Sorry. The form application that was submitted for authorization to inject.

A. Oh, okay. I would have to pull that up. Could you put it up on the screen for me?

Q. Yeah. Do you see this page from your C-108 here? Do you recognize this?

A. Yes, thank you.

Q. This is a list of wells that were identified as the source water wells for injection. Are these the wells that the bulk, exhaustive list of wells that Foundation is proposing as potential re-completion candidates?

A. Yes.

Q. Okay. So there is no other wells other than those that you are looking to re-complete?

A. Correct.

Q. Okay. And so based on that, based on the facts these wells are producing from (unclear) that the water content chemistry will be essentially the same as what was provided in the water chemistry samples?

A. Yes, I expect so.

Q. Okay. Now, on the water chemistry issue, in your written testimony you stated that the water content is similar, you know, between the disposal zone, the receiving formation and the source water. But I note there was some differences in terms of CO2, dissolved CO2 concentrations and hydrogen sulfide. Is that your understanding?

A. I actually have not seen water data from the Bell Canyon. I was just making, making an assumption based on what I could discern from the well logs and Brushy Canyon water data, so I could not comment on how those compare.

Q. Okay.

A. At least I haven't seen one from very nearby.

The closest Bell Canyon data I could find was in Texas to the south.

Q. But Foundation submitted a source -- a receiving formation water sample with the C-108.

A. Uh, interesting.

Q. Okay.

A. I maybe haven't seen that. We don't have -- as far as I know -- maybe Adam can comment otherwise -- as far as I know, I don't think that we have taken a water sample from the Bell Canyon yet unless we got some from the Bitsy and I was unaware of we had a sample from the Bell.

Q. Okay. So you haven't compared the water chemistry between the receiving formation and the source water that Foundation is proposing to inject into that zone?

A. That's correct.

Q. Okay. I want to talk more about the Bitsy, and understand more about, you know, Foundation's operations around it. In your summary, I understood your opinion to be that Foundation believes that the Bitsy has (unclear) capacity for one more re-completion.

REPORTER: Let me interject. Mr. Rankin, if you could keep your hand away from the front of your face, you are blocking audio.

MR. RANKIN: Sorry about that, bad habit.

Q. Mr. Pansa, to repeat my question, I was asking

you, I understood your testimony, written testimony in your summary to be that Foundation's -- your opinion is that the Bitsy has room to handle produced water from one more re-completion; is that correct?

A. Yes. We expect so.

Q. What is the basis for your opinion that the Bitsy is -- is -- and just to be clear, is it your opinion that the Bitsy is, is running out of capacity for further, to receive further produced water?

A. I think that it is an issue of the low pressure, the low pressure cap on that injection that limits the amount of water that we can put in that well per day, you know, the limitations of the permeability and that low pressure.

Q. Okay.

A. So I think it will take more barrels, just not at the rate that we will need.

Q. Okay. And that's based on the fact that it's completed in the Cherry Canyon, and you are looking at the Bell Canyon for Blue Quail; correct?

A. Yes. And we also have perfs in the Bell Canyon in that, in the Bitsy as well, so it's completed in both.

Q. Oh, okay. When did that happen?

A. It must have been at least 18 months ago, I think. Somewhere around there.

Q. Okay. And is it perfed across the entire interval within the Bell Canyon?

A. No. The perforations I have for it are around, around 5,000 feet. So that's about 100 feet below the sands, stratigraphically below the sands we intend to inject in in the Blue Quail 1.

Q. So in other words, the Bitsy is -- had some re-completions for disposal in depths that are below what what the Blue Quail 1 would be?

A. That's correct.

Q. Okay. So Foundation could go back and re-complete some additional perfs further uphole in the Bell Canyon if it wanted to for purposes of injecting more into the Bell Canyon?

A. Potentially.

Q. So let me ask you this about the Bitsy. What's the current maximum surface operating injection pressure for that well?

A. I'm not exactly sure.

Q. Okay.

A. I will defer to Adam on that.

Q. Do you know whether the Bitsy has exceeded ever the maximum operating injection pressure that it's authorized to inject at?

A. I'm not aware of it ever exceeding. I think we

have -- we have a physical, a physical device to keep it from exceeding that.

Q. Do you know if it has approached the maximum surface injection pressure?

A. Yeah, I'm sure it has approached the maximum injection pressure.

Q. Do you know what -- how close it's come or what the average injection pressures are for the well?

A. Adam might be able to comment a little more on that, the details of our operations on that.

Q. Okay. So now I want to ask you this again, and if you have to defer to Adam, that's fine. In terms of current injection operations at the Bitsy, how many, how many wells, producing wells are currently providing source water for the Bitsy?

A. I think seven.

Q. Okay. That's your best guess -- not guess, but your best answer at this point is seven wells is your understanding?

A. Yes.

Q. Okay. So what are Foundation's plans for operating the Bitsy if the Blue Quail 1 is approved for injection and injection is successful to the Blue Quail 1, what are Foundation's plans for operating Bitsy?

A. We would continue to inject in the Bitsy up to

the capacity that it would take underneath the stipulated pressure cap, and then we would put any incremental additional barrels that we needed to dispose into the Blue Quail 1. We would continue to use the Bitsy until we had enough re-completions to spill over into that Blue Quail 1, which would be per (unclear) most likely.

Q. But your plan would be to operate both wells together?

A. Correct. Okay. Now, just to be clear, I just want to make sure I understand it, it's not your opinion that Bitsy is reaching its sort of capacity, it's that the Bitsy is unable to accept the volume at the rate Foundation requires to complete -- re-complete its wells in the sequencing and timing that Foundation prefers. Is that a fair characterization?

A. Yes.

Q. Okay. Because, in other words, I guess my point is that Foundation could stage its re-completions in a manner that would allow Foundation to inject into the Bitsy at the rates and capacities currently authorized. Is that a fair statement?

A. Goodness, it would probably take 20 years, but I suppose, yeah, the time value of money would probably make that an uneconomic choice.

Q. Okay. But sitting here today you don't know what

the current injection -- do you know what the injection rates are currently with the Bitsy?

A. I could speculate, but I would prefer to pass that on to Adam.

Q. Okay. Okay. All right. I will save those for Adam then.

Let's see. Now, on the re-completions into the Bitsy, are you aware of whether, whether those re-completions into the Bell Canyon were actually performed?

A. Definitely they were performed. We added perfs in the Bell Canyon and were then able to reduce our pressure at which we were disposing of the amount of water we had at that time.

Q. Okay. Has, has Foundation considered seeking an increase in the pressure limits authorized to inject as a result of its perforations into the Bell Canyon?

A. I think we did consider that, and that to be a dead end.

Q. Okay. Why is that?

A. I think we were told that, that we would not be able to get a pressure increase.

Q. Okay. And who told you that?

A. Gosh, I would have to dig that up. I don't remember.

Q. Somebody within Foundation or somebody outside of

Foundation?

A. No. Someone from a regulatory body.

Q. Let's see. On the re-completion plan -- actually, this is just because I don't understand the exhibit, okay, so I just want to make sure I understand it.

So I'm going to share with you Exhibit 10, okay, which is your -- I forget what you called this. What do you call this? Let me know when you see it.

A. Yeah, I can see it.

Q. It's the Geoframe Processed Interpretation exhibit; right?

A. Yes.

Q. Just if you could, tell me what each of these logs shows. What do they -- what's the point of each one from left to right?

A. Okay. Left to right. On the left is gamma ray.

Q. Uh-huh.

A. That's showing the gamma ray signature of the rocks. And then next over there is a water saturation curve, and then next over is the permeability and resistivity with the resistivity being the lines, and the permeability being the shaded in blue.

Next line over is a porosity reading, as well as a PE curve to comment on (unclear). The next line other is a decay curve that is -- that's representative of the size

of the pores and it also helps indicate if there is hydrocarbon within those pores based on the, based on the speed of the neutron decay.

Q. Is that this pool tract here that I have my cursor over?

A. Yes, it is.

Q. So I'm clear, what indicates hydrocarbon show in this tract?

A. I believe it's slow decay. So that would be a shift to the right -- let's see. I would have to reacquaint myself with that portion of it because the main thing that's shown is that the farther right the peak goes, the larger the pores are.

Q. Okay, all right. And then the last tract here, which is the multi colored tract, is the elan fluid analysis. What does is that show?

A. That shows like a calculated porosity amount and then an estimated volume of what kind of fluids are in those pores based on all the other measurements.

Q. This key on top, does that indicate what the nature of the fluids is. Is that right?

A. Yes.

Q. So if it's green it indicates that there is -- interpretation is that there is oil in that zone?

A. Yes.

Q. And this is in the Sharbro Fed 10 well; is that right?

A. Yes.

Q. Okay. But based on your testimony and the geology, the consistency between these various examples within the Delaware Mountain, this interpretation would be essentially applicable to the Foundation's offsetting wells that it's intending to re-complete. Fair to say?

A. Yes. Certainly it would be applicable for permeability and -- for permeability and mineralogy and such. I wouldn't necessary re-complete into an oil zone, you know, assume that the oil was there just because it was in this well due to structural changes and such, but stratigraphically they should be similar.

Q. And that's the same for the Blue Quail Number 1 well; is that correct?

A. That's correct.

Q. Okay. Now, you testified that Foundation -- that you are certain Foundation will strand areas behind pipe in the Brushy and Cherry Canyon if it's not economically able to dispose of produced water that would be generated through its, its proposed re-completions; correct?

A. That's correct.

Q. And the Blue Quail 1, it has produced from both the Brushy and Cherry Canyons; correct?

A. That's correct.

Q. Okay. And at the time -- now, it's no longer producing; correct? It's currently inactive. It's in the temporary abandoned stage; correct?

A. Correct.

Q. Has, has the Blue Quail 1, has it fully depleted the Brushy Canyon?

A. No.

Q. Has it fully depleted the the Cherry Canyon?

A. No.

Q. Now, my understanding is that, based on your exhibit, that there is a -- I want to stop sharing my screen now -- based on your exhibits and the C-108, that there is some stuck tubing in the (unclear) is that correct?

A. I would have to defer to Adam on that.

Q. All right. I will save those questions for him. Now, in your opinion is the Bell Canyon, is it a better reservoir for disposed water because of its porosity and permeability than the Cherry canyon is?

A. I think they are similar.

Q. Similar, okay. You couldn't say sitting here today based on your assessment whether one is better than the other?

A. No.

Q. You can't say sitting here today whether the Bell

Canyon has -- is able to receive a higher rate of injected fluids than the Cherry Canyon?

A. Geologically they are very similar. I would expect them to perform similarly.

Q. Okay. Very good. Let me make sure I've got -- on the plan for re-completion Foundation is -- my understanding is that -- how many wells Foundation ultimately determines should be re-completed is dependent upon the success of those re-completions; correct?

A. Yes. Mostly depending on how much rates of water those make.

Q. And whether or not you are able to dispose of that to match those production rates?

A. Correct.

Q. All right.

MR. RANKIN: No further questions. At this time. Thank you very much.

HEARING EXAMINER ORTH: Thank you, Mr. Rankin. Mr. Ames, do you have questions of Mr. Pansa?

MR. AMES: Madam Hearing Officer, I do not. Thank you.

HEARING EXAMINER ORTH: Thank you. Mr. Lamkin, do you have questions of Mr. Pansa?

TECHNICAL EXAMINER LAMKIN: Yeah, I have a couple of questions.

Do you happen to know if Foundation notified the (unclear) of the addition of (unclear) to the Bitsy well?

THE WITNESS: Yes, I know that we did.

TECHNICAL EXAMINER LAMKIN: Okay. Are you aware of any specific cut-off range for H2S content or dissolved CO2 that would be inherently corrosive to tubulars.

THE WITNESS: No. That would be outside of my area of expertise. Perhaps -- perhaps Adam as an operations engineer could comment a little bit more educatedly on that.

TECHNICAL EXAMINER LAMKIN: Okay. Thanks. I believe the remainder of my questions might be better suited for the next witness. Thank you.

THE WITNESS: Uh-huh.

HEARING EXAMINER ORTH: Thank you, Mr. Lamkin. Mr. Mani, do you have any follow-up questions of Mr. Pansa?

MR. MANI: No, Madam Examiner.

HEARING EXAMINER ORTH: All right. We'll excuse Mr. Pansa then. Thank you very much, Mr. Pansa.

THE WITNESS: Thank you.

HEARING EXAMINER ORTH: If you would call your next witness, Mr. Mani.

MR. MANI: My last witness is Mr. Adam Johnson, petroleum engineer.

HEARING EXAMINER ORTH: Mr. Johnson?

THE WITNESS: Yes.

HEARING EXAMINER ORTH: I figured how it was him speaking.

THE WITNESS: Yes.

ADAM JOHNSON

(Sworn, testified as follows:)

DIRECT EXAMINATION

By MR. MANI:

Q. Mr. Johnson, are you -- you are on the telephone, is that right, not on a desktop computer?

A. Yeah, that's correct, I'm speaking through a telephone.

HEARING EXAMINER ORTH: He is going to have to raise his voice substantially from there.

Q. So, Adam, just to clarify, we are not going to have any video of you, so make sure you talk very directly into the cell phone as much as possible. Let's begin.

Mr. Johnson, what is Foundation's need for converting the Blue Quail Fed Number 1 into a salt water disposal well?

A. Additional volumes for the potential re-completion, as well as, you know, potential salt water disposal well if the Bitsy ever, for any reason, mechanical failure or anything, we are unable to inject water into the Bitsy, it would be beneficial to have those back-ups as well because all of our wells in the area, all our producers rely

on the Bitsy for salt water disposal.

Q. And the Bitsy disposal well is not running out of capacity to accept fluid, it's simply a low pressure salt water disposal well, so it's limited by daily volume of fluids that can be injected; is that correct?

A. Yeah, that's correct.

Q. All right. So the need for the Blue Quail Fed Number 1 to be converted to a salt water disposal well is to have an additional salt water disposal well at a low pressure volume disposing of fluids that will exceed the daily allowable injection into the Bitsy and also as a back-up in the event that Bitsy mechanically is, is -- goes down temporarily; is that correct?

A. Yes.

Q. All right. What are Foundation's proposed disposal operations with regard to the Blue Quail Fed?

A. Can you repeat the question?

Q. Yes. The question was, what are Foundation's proposed disposal operations with regard to the Blue Quail Fed? And I guess what I mean is, are the proposed disposal operations strictly for Foundation's wells and not for third-party disposal fluids?

A. Yes. The proposed operations are strictly for Foundation wells.

Q. And the anticipated rate of daily disposal is

approximately 750 barrels of water per day; is that correct?

A. Yeah. Or in there.

Q. In the application the maximum disposal rate was 1500 barrels of water per day; is that correct?

A. In the initial application I believe it was 1500 barrels of water per day.

Q. Yes. And you're aware of some of the limitations that are proposed by the Commission which may limit that barrels of water per day to 1000 barrels of water per day. Is that correct?

A. That's correct.

Q. All right. What is your anticipated average surface injection pressure for the Blue Quail Fed well?

A. About 500 psi.

Q. And the maximum pressure, surface pressure?

A. It would be roughly 900 psi.

Q. All right. And you're aware that -- that the Commission has proposed -- may have proposed a limit of a maximum surface injection pressure of 928 psi; is that correct?

A. Yes.

Q. All right. The disposal fluids will all be from Foundation's wells in the vicinity; is that correct?

A. That's correct.

Q. All right. And there has been a chemical

analysis of some of the disposed -- proposed disposed salt water fluids that's been performed. Is that correct?

A. Yes.

Q. And all that information is included in your Exhibit 6. Is that also true?

A. I believe so.

Q. All right. Can you describe the proposed construction of the Blue Quail Fed well with regard to ensuring that Foundation's proposed disposal and storage operations will confine the injected water into the Bell Canyon formation?

A. Yeah, we have CVL confirming that -- we have CVL confirming the top is 370 feet from the surface. We do not CVL coverage across the proposed injection interval.

Q. So we are showing that the wells will be plugged back to about 4860 feet. That would include 40 feet of cement on top of a cast iron bridge plug; is that correct?

A. Yeah. That's correct.

Q. And then Foundation will, will inject through perforated casing, not open hole; is that correct?

A. Correct.

Q. All right. And the proposed interval for injection is 28 feet thick, being from approximately 4776 feet down to 4804 feet?

A. Yes.

Q. All right. And it's your understanding that that interval corresponds with the Bell Canyon formation --

A. Yes.

Q. -- of the Delaware Mountain Group? All right, thank you. Are those facts and schematics depicted in your Exhibit 7?

A. Yes. On the well diagram?

Q. Yes.

MR. MANI: At this time I would like to offer Exhibits 6 and 7 for acceptance and then continue with my questions.

MR. RANKIN: No objection, Madam Hearing Officer.

HEARING EXAMINER ORTH: Thank you. I believe there was no objection from either Mr. Rankin or Mr. Ames. Exhibit 6 and 7 are admitted. Thank you.

(Exhibits 6 and 7 admitted.)

MR. MANI: Thank you.

Q. Based on Foundation's injections operations and the volumes stated, Adam, how will the injection volumes and pressures affect the Bell Canyon disposal zone?

A. We don't suspect any -- we suspect most of the pressure distribution will happen -- well fall of within approximately 200 feet of the wellbore. We don't think any significant increase in reservoir pressure after 200 feet away from the proposed injection wellbore.

Q. And that's based on the 28 foot injection interval?

A. Yes.

Q. All right. So once injection -- if the application is approved and once injection has begun, what type of -- in normal drilling operations through that injection zone, what would be the normal pressure gradience expected and what weight of drilling mud, approximately, would -- would an entity that wanted to drill through it to deeper depths encounter?

A. It's my understanding it's relatively normally pressured, in my calculations I assumed they would be drilling through the Bell Canyon with nine pounds per gallon drilling mud. I suspect it could be potentially higher. I was conservative in assuming nine pounds per gallon mud which would equate to roughly 167 psi over normal pressure at the proposed injection depths.

My calculation -- my equation assumes that there will not be an increase of reservoir pressure 700 feet away from our wellbore that is greater than 167 psi, so it will not be seen during drilling operation.

Q. Is, is that comparable to what Foundation experienced when it drilled the Sharbro well near the Bitsy injection well?

A. Yeah. We did not -- we did not drill those

wells, but looking at the record, we did not see any issues with drilling through the same injection zone that the Bitsy ways injecting into.

Q. No pressure disturbances, no influx of formation fluids?

A. No, not from the records we saw.

Q. All right. Based on the information and data that you reviewed, do you find any engineering evidence of any hydrologic connection between the Bell Canyon formation disposal zone and any shallower underground sources of drinking water?

A. No.

Q. Based on the same information, do you find any engineering evidence of any hydrologic connection between the Bell Canyon formation disposal zone which is proposed, and any deeper geologic formations which are either currently producing or potentially producing?

A. No, I do not.

Q. All right. If the application is granted, what are Foundation's development plans for its wells in the vicinity?

A. I will defer to Tyler. I agree with his description earlier.

Q. And if Foundation, if the application is denied, how will that affect it's re-completion development plans?

A. Yeah. We will not be able to do any further re-completions.

Q. If, if Foundation were, say, required or -- not required, but if Foundation, did it look at the possibility of drilling a very deep Devonian Silurian disposal well? And, if so, what were the costs expected compared to the economic benefit compared to -- I'm sorry, in relation to the re-completion operations? Would that be an economic option?

A. No, that is not an economic option. Wouldn't have been close in economics.

MR. MANI: Thank you. At this time, Madam Examiner, I would like to pass the witness.

HEARING EXAMINER ORTH: Thank you, Mr. Mani. Mr. Rankin, do you have questions for this witness?

MR. RANKIN: I do, Madam Hearing Officer, but I wonder if, if we might take a short break.

HEARING EXAMINER ORTH: Certainly.

MR. RANKIN: To allow he me to, well, take a break.

HEARING EXAMINER ORTH: Sure. Let's take about ten minutes.

MR. RANKIN: Ten minutes. Thank you very much, Madam Hearing Officer.

HEARING EXAMINER ORTH: Thank you.

(Recess taken.)

HEARING EXAMINER ORTH: When we broke it was Mr. Rankin's turn to ask questions of Mr. Johnson.

MR. RANKIN: Thank you, Madam Hearing Officer, for the break.

CROSS-EXAMINATION

BY MR. RANKIN:

Q. And I guess Mr. Johnson is there?

A. Yes.

Q. All right. Mr. Johnson, I think what I would like to do is start -- you are on the phone, so I don't know, are you able to see a computer screen? Are you looking at a computer screen?

A. Yeah, I can see it.

Q. Maybe what I think what I would like to do is I want to understand a little bit more about the subject well, the Blue Quail Number 1, and I'm going to share with everyone my screen here.

The existing -- it's going to be the existing wellbore diagram for the Blue Quail Number 1. Can you see it on your screen?

A. Yeah. Yeah.

Q. Will you review for me the history of this well and how those two fish came to be stuck where they are?

Q. Yes, the -- I wasn't over the area when these

workovers were completed. I can speak to as to why the fish, the top fish is there.

Q. Okay.

A. Roughly three or four years ago we, we were on the well for whatever reason, I think we were trying to pull tubing, and we had stuck tubing, and we cut it off at that point roughly around 500 feet and 4902 on top of the fish. It was 7/8 tubing with an ESP cable on the outside of the tubing. We weren't able to recover the fish.

We tried spearing on the inside the fish, but we were not able to recover it, so it's been there since roughly 2016.

Q. Okay. So that workover was -- that resulted in the stuck fish was back in 2016?

A. Yes.

Q. Do you know, it hasn't produced since then; correct?

A. No.

Q. No? Okay. Do you know what the purpose of workover was at the time?

A. Production had been falling off, maybe replacing a pump. I can't remember off the top of my head.

Q. So you're not sure what, what the purpose was or what was going on, but in any event, the company was pulling tubing and the tubing got stuck, the company cut off the

tubing at about 5500 feet resulting in the current arrangement within the wellbore?

A. Yes. We cut the tubing off at 4900 -- 4,902 feet.

Q. Now, Mr. -- you testified that, in your direct testimony, that, in your opinion, there was no more -- that the Blue Quail 1 doesn't have any remaining reserves which would be lost, so there is no loss of value by converting the well to an SWD; correct?

A. Correct.

Q. Mr. Pansa testified that the well had not yet fully depleted the Brushy or Bell Canyon, so there still is remaining reserves in that well. Agreed?

A. Well, when you factor in the cost to remove the fish and the likelihood of removing the fish, there aren't any remaining reserve when you factor in that investment --

Q. Okay. So that -- sorry.

A. When you factor in the investment and the probability, there aren't any remaining reserves.

Q. So Foundation has evaluated the cost to remove that stuck tubing?

A. Yeah. I know we tried it, and we didn't have any luck. Me, specifically, I've not looked into the further cost of trying to remove it again, trying to fish it out again. I can't remember what that is off the top of my

head.

Q. You say Foundation has or has not looked at -- recently looked at the cost of trying to remediate that well?

A. We have -- one of my other coworkers gave me a number that I used for the reserve calculations. I can't remember what what number is.

Q. Okay. But you're --

A. May be a couple hundred thousand dollars.

Q. Okay. So other than the initial effort to remove that fish back in 2016, Foundation hasn't attempted to remediation that stuck fish to this point; correct?

A. That's correct.

Q. Okay. And you have not evaluated -- and it will be at least a couple hundred thousand dollars to remediate at this point. That's your understanding?

A. Correct.

Q. Okay. Has Foundation evaluated the possibility of permanently abandoning the Blue Quail Number 1?

A. Nah, no, with the utility as a potential SWD we haven't.

Q. So you haven't looked at what the cost would be for a P and A situation?

A. No.

Q. No, okay. At this point, obviously converting

the well to a disposal in the Bell Canyon formation would be a cheaper option than trying to remediate the well by removing the fish and getting it back on production; correct?

A. Yes.

Q. Let's see. On your direct testimony you testified that the Blue Quail Fed Number 1 wellbore is structurally and mechanically sound. Do you recall that?

A. Yes.

Q. I think I understood you to say that Foundation has a cement bond log -- rather, does not have a cement bond log for -- that covers the portion of the wellbore that would be for the injection interval; is that correct?

A. Correct.

Q. But it has a cement bond log that covers the top of the Avalon and bottom of the Brushy?

A. I can't -- I don't know the exact depths for the formation tops. We have cement -- we have a CBL that covers from roughly 370 feet down to 1000 feet then CBL coverage picks back up again from roughly 6550 down to 8800 feet.

Q. Okay. Okay. So at least as to the point of the injection interval, you don't -- you can't say what the condition of that wellbore is, at least the condition of the cement because you don't have a cement bond log for that portion of the well?

A. Yes.

Q. Okay. All right. I'm going to try my best not to jump around. I apologize, I probably will, and it's probably because -- you know, I try to be organized, and I think it's probably because some of the question I had for your colleagues have been deferred to you, and so I want to go back and try to make sure I cover those. Okay?

Now I wanted to just confirm, but my understanding from Mr. Pansa was that the -- that Foundation has strong approval to add additional perforations in the Bitsy -- within the lower portion of the Bell Canyon. Is that correct?

A. I wasn't over the area during that time, so I can't -- I'm going to defer to Tyler's knowledge on that.

Q. So you don't know whether -- you can't confirm that's the case or whether Foundation actually completed those perfs in that zone -- in the Bell Canyon Zone?

A. No, I can't.

Q. Okay. As to the current set-up at the Bitsy Federal SWD well, are the wells that are identified as potential source wells or wells for re-completion, are those connected by pipeline to the Bitsy for purposes of piping produced water to the Bitsy for disposal?

A. Yes. They are all piped to the Bitsy.

Q. Does the Bitsy have other surface facilities

associated with it's produced water injection?

A. The Bitsy has its own SWD facility with its own tanks and its own pumps. Does that answer your question?

Q. Yeah, I think. So basically just trying to visualize, if water from Foundation's existing wells are being piped over to the Bitsy where the water is being held in tanks and then is being injected into the well at that location; correct?

A. Yeah, that's correct.

Q. So Foundation would have to build a similar set-up -- assuming it gets authority to do so -- at its Blue Quail 1 well, set up pipelines to the Blue Quail well so that it can inject there as well, the tanks; correct?

A. No. The current plan would be to use the Bitsy's SWD facilities and pump and run a line from the Bitsy discharge of the pump over to the Blue Quail Number 1.

Q. So you wouldn't duplicate systems, you just add an extra line running over to the Blue Quail. So you would use the same tanks?

A. Yes, sir.

Q. Okay. I gotcha. That way Foundation is, the plan would be to operate both wells and sort of in a coordinated fashion?

A. Sorry. Can you repeat that question, please?

Q. Was it Foundation's plan to operate both wells

together?

A. Yeah.

Q. Okay. Now, did Foundation investigate or evaluate increasing -- rather, perforating additional zones within the Bell Canyon in the Bitsy and injecting solely into the Bitsy to service its re-completions?

A. I believe all the other potential SWDs zones have been perfed. That's why we only looked at -- that's why we are looking at the Bell Canyon for disposal.

Q. Mr. Johnson, did you hear Mr. Pansa's testimony that the completions that were perfed in the Bitsy and Bell Canyon were 100 feet below what is being proposed for the Blue Quail in the Bell Canyon?

A. No. So I must have misunderstood the question. You are asking if we have looked at any other zones in the proposed Blue Quail Number 1 to inject into outside of the Bell Canyon?

Q. No. I'm asking if Foundation has evaluated the possibility of expanding the injection interval within the Bitsy by including additional -- expanding the injection interval in the Bell Canyon beyond what is currently perforated?

A. Oh, I have not worked that. I have not looked into that. I would have to defer to Tyler on that.

Q. Okay. So Foundation, to the best of your

understanding as you are sitting here today, Foundation has not evaluated expanding the injection interval to include the same zones that Foundation is proposing to inject into Blue Quail 1?

A. Correct. Yeah, I have not worked that project, that aspect.

Q. Okay. When I was discussing the Division's proposed conditions of approval with your colleagues, one of the conditions was deferred to you. One of my questions on the conditions was deferred to you, and that's the one, the last one. Do you have that in front of you, or do you want me to put it on the screen?

A. Could you put it on the screen, please?

Q. I would be happy to. Do you see Condition Number 8 from the Oil Conservation Division's prehearing statement on your screen?

A. Yes.

Q. Mr. -- I think it was Mr. Pansa, but it may have been Mr. Garvie, stated that Foundation -- that the conditions proposed by the Division were acceptable to Foundation with the exception of potentially this condition Number 8. Is that your understanding as well?

A. I think, I think what we meant there is we were hoping to get a little more clarity on the terms of the well being shut in during drilling operations, how long before

and how long after. How big a radius is required for wells surrounding our injection well for it to be shut in.

Q. Okay. But as to the prior seven conditions, your understanding is Foundation didn't have any objections to those?

A. We did not have any objection to the first seven.

Q. Okay. But the only concern on 8 is what the parameters were for requiring Foundation to shut in its production?

A. Yes, yes.

Q. Okay. Very good. Now, tracking through my -- my -- the bits here that I'm trying to nail down, Foundation has submitted two re-completion applications that are pending before the OCD; is that right?

A. Yes.

Q. And those were for, I believe it was the Sharbro 6 and 4?

A. Yes.

Q. And those have -- those have not yet been approved; is that right?

A. They have not been approved.

Q. Okay.

A. To my knowledge.

Q. Okay. And once -- assuming they are approved, does Foundation have a rig scheduled or contracted for to

complete those two re-completions?

A. Oh, yeah, they have to be approved. (Unclear) apparently restriction in the area. I think that expires on June 15, and at that point we will begin the work to hire a rig and frac crew and all of that.

Q. Okay. So when your AFE is approved, that means that Foundation has money allocated and budgeted towards the cost of contracting that rig and doing the re-completions?

A. Yes, we do.

Q. And so those are scheduled for 2020 for both of these re-completions.

A. Yeah, 2021.

Q. I'm sorry, I have forgotten we have entered a new year. So for 2021, thank you. Are there any other re-completions that have been -- applications that have been prepared by Foundation for filing?

A. No. Only those two so far.

Q. And before Foundation proceeds with any others, will it wait to see what the results are from these two that are pending for the summer?

A. Yeah. That's correct.

Q. Okay. So beyond these two right now, there is no firm plans to prepare additional re-completions at this time until you get the results back from the two pending?

A. No, there aren't any.

Q. I want to talk a little bit more, going back to the Bitsy, I had some questions for Mr. Pansa, but I don't think he was fully equipped to answer them, I hope you are. Are you familiar with the operation and operational parameters of the Bitsy Federal SWD?

A. Yes.

Q. Has the Bitsy -- what is the current average surface injection pressure that's being experienced at the Bitsy right now?

A. We're ranging from 600 to 700 psi, the injection pressure currently.

Q. And what's the maximum?

A. The maximum is 930 psi.

Q. 930?

A. Yes.

Q. Okay. And I just want to make sure I understood because the limitations on the Bitsy are not -- it's not a volume limitation; correct?

A. It's a pressure limitation.

Q. And based on how many -- my understanding from Mr. Pansa, there are currently seven wells providing source water for that injection operation; correct?

A. Yes.

Q. And Foundation is not, not currently approaching it's maximum injection pressure in that well; correct?

A. I mean, we're probably 60 to 70 percent of the maximum allowable pressure.

Q. Okay. And did you hear Mr. Pansa's testimony about how Foundation plans to stage it's re-completions?

A. Yes.

Q. And what's the basis for -- what's the basis for Foundation's staging? In other words -- let me ask it a better way. What are Foundation's plans for staging its wells re-completions? Is it to do two at a time or three at a time, or what's the plan in terms of how to stage those re-completions?

A. I would say we would probably do two at a time, potentially three at a time, evaluate the results, and move forward in a couple of rounds.

Q. So anywhere from two to three completions at a time, and as I understand looking at exhibits -- looking at Exhibit 5 on Page 2, and I will share it with you so you can see it. So let's -- is this is a summary of your re-completion results on the Blue Quail 3?

A. Yes.

Q. Okay. And you report here that the -- that Blue Quail 3, to date, has produced on average 200 barrels of water per day?

A. Yes.

Q. Okay. And that's -- you expect the same average

produced water volumes to result from your additional re-completions?

A. Yeah, at least 200, if not more.

Q. Have you -- has Foundation completed any other -- I mean, other than the Sharbro -- rather than -- other than the Sharbro 10 and Blue Quail 3, has Foundation re-completed any other wells in the zones in the area.

A. No. The Blue Quail 3 is the only zone we have re-completed so far, the only well.

Q. That's the only basis for data on the volumes of water that you would, you know, expect to see on your re-completions; correct?

A. Yeah, that's correct.

Q. Okay. So has -- in Foundation's operation of Bitsy federal, has Foundation approached, you know, gotten to within, you know, ten percent of its maximum operating pressure in that well?

A. I'm not sure. I would have to check on that. I don't know off the top of my head.

Q. So sitting here today you don't know, you know, you don't know whether Foundation has even approached its, its maximum operating pressure within that well?

A. No. I know we average 6-, 700 psi, but I don't know in a specific instance if we have gotten any higher than that. I would have to check.

Q. Do you know based on that, on that pressure, average operating pressure what the average rates of injection were for that well?

A. The average injection rates are also 600 to 700 barrels of water per day.

Q. Okay. So sitting here today, you can't tell me, you know, what volume of water would achieve or would exceed the maximum operating pressure allowed of the Bitsy federal?

A. No, I couldn't.

Q. So you can't tell me, sitting here today, whether or not the Bitsy Federal actually would be sufficient at your current proposal of two to three completions, whether the Bitsy federal would be sufficient to handle that water?

A. Due to the fact that we are 60 to 70 percent of current allowable pressure, I would -- yeah, I guess I couldn't speak to how many more re-completions we can fit in the current injection well.

Q. Okay. And in the Bitsy, as I understand it from Mr. Pansa's testimony, you still have a full interval that is being proposed in the Blue Quail that you can perf in the Bitsy for additional injection zone. Correct?

A. I don't think so. I would have to defer to Tyler on that.

Q. Okay. That's fine. I'm going to -- you may -- I don't know if you listened to my testimony, my discussion

with Mr. Pansa, but did you hear us discussing -- I asked him whether or not he had an opinion over whether the Bell Canyon was a better reservoir for receiving produced water than the Cherry Canyon. Did you hear me ask that question of Mr. Pansa?

A. Yeah, I did.

Q. Do you have an opinion on whether the Bell Canyon is a better injection zone, can receive a higher rate or volume of water than the Cherry Canyon in this area?

A. No, I couldn't speak to that.

Q. Okay.

A. I defer to Tyler on that.

Q. Now, my understanding is that Foundation's view is that if it's unable to drill -- rather, re-complete convert the Blue Quail 1 and 2A injection well, that it will -- that reserves will be stranded behind pipe in the Brushy and Cherry Canyons and its offsetting wells. Is that Foundation's position?

A. Yeah. Yes, that's correct.

Q. I guess I don't understand your meaning of strand because those reserves won't be lost, they will just be -- my understanding is that, that Foundation would be able to nevertheless complete its wells, re-complete its wells in those zones, just at a different staging or different rate than it would otherwise do if it had more, potentially more

disposal wells.

A. Yeah, correct. I guess the way I define reserve, it has to be economic to be called reserves and it has to have an existing structure in place for disposal of the water.

Q. Okay. But Foundation has those facilities in place for the Bitsy, and we don't know, I guess, how much additional water it would take at this point to -- you can't tell me how much additional water it would take for it the Bitsy to exceed it's maximum allowable operating pressure?

A. Correct. I would have to look into that.

Q. Okay. So my understanding of your analysis, I'll just continue to share my screen here. I'm going to flip down to your equation, your -- your reservoir pressure distribution equation, based on your analysis here, you agree with me that distance is a factor, essentially, in whether a drilling operation might experience impacts from produced water being injected by an offsetting salt water disposal well?

A. Yes.

Q. I guess the whole point of this is to kind of demonstrate that distance is a factor; right?

A. Right.

Q. Okay. And you agree with me that when wells are

closed, just as a general statement, to the source of injection, it's more likely they are going to experience impacts from produced water being injected than wells that are being drilled farther away?

A. There is a greater potential, yeah.

Q. That's essentially what your analysis shows, okay? So Foundation has, my understanding is that -- I asked this question earlier, but not to you, but let me step back -- has Foundation drilled any wells itself in the vicinity of this area.

A. No, we haven't drilled any wells.

Q. Okay. So you, yourself, don't have any experience drilling through the Delaware Mountain Group?

A. No.

Q. And you don't have any knowledge or experience first hand of what the typical drilling over pressures are in this area.

A. No.

Q. Other than what your, what the pressure distribution equation indicated?

A. Correct. Other than just looking at drilling reports of the wells when they were drilled, I don't have any firsthand knowledge.

Q. Okay. I understand you provided some direct testimony about that Foundation looked at the potential of

drilling a Devonian well for disposing of its produced water; is that right?

A. I know we looked at the 16, 18,000 foot disposal well.

Q. Those are uneconomic; right?

A. Correct.

Q. And has Foundation evaluated whether there might be another location either for drilling a new well or re-completing another well for Delaware Mountain Group disposal in the area?

A. No, I have not worked on that personally.

Q. Mr. Johnson, I'm just trying to review real quick and see if I left off anything that I want to touch on. I don't think I did, so I thank you.

MR. RANKIN: Thank you for the time, Madam Hearing Officer. I have no further questions for Mr. Johnson.

HEARING EXAMINER ORTH: Thank you, Mr. Rankin. Mr. Ames, do you have any questions?

MR. AMES: No questions. Thank you.

HEARING EXAMINER ORTH: Mr. Lamkin, do you have any questions for Mr. Johnson?

TECHNICAL EXAMINER LAMKIN: I do have a couple of questions. When you were doing your pressure dispersion calculations, were you considering radio flow with infinite

boundary conditions?

THE WITNESS: The equation assumes a steady state for pressure boundary would have been reached.

TECHNICAL EXAMINER LAMKIN: Okay. And do you believe that the, that the pressure front is only going to travel approximately 200 feet. Is that what you said said?

THE WITNESS: Most of the pressure dissipation would happen within 200 feet.

TECHNICAL EXAMINER LAMKIN: So do you think if there was a well drilled 268 feet away that there could potentially be some adverse effect?

THE WITNESS: Yeah, there could be -- no, probably less than 100 psi above normal pressure, and that's assuming nine pounds per gallon mud, you would be over balanced enough to not notice the increase in reservoir pressure 200 feet away from the proposed injection well.

TECHNICAL EXAMINER LAMKIN: Okay. Are you aware of, of what -- of what -- H2S content or dissolved CO2 content, at what level it becomes inherently corrosive to non-corrosion (unclear) tubulars?

THE WITNESS: I do not know a specific level. I know that H2S has been an issue in the area, and we have been injecting for a while. And (unclear) casings aren't common in the area, so that's all I can speak to that.

TECHNICAL EXAMINER LAMKIN: Okay. You said that

the 50s average injection pressure is between 600 and 700 psi?

THE WITNESS: Yes, that's correct.

TECHNICAL EXAMINER LAMKIN: Are you aware that the only reported average pressure to the OCD has been a consistent 800 psi since 2015?

THE WITNESS: I'm not aware of that. I will have to get with our reporting group. I was referring to gate sheets, so I will have to -- I'm not aware of that.

TECHNICAL EXAMINER LAMKIN: Okay. And then maybe this last question would be better suited for Mr. Pansa, but are you aware of any attempted negotiation or, you know, compromise that has been sought between Foundation and Devon outside of using their disposal?

THE WITNESS: I was not involved in any of those. I think Tyler might be more knowledgeable on that.

TECHNICAL EXAMINER LAMKIN: Okay. And are you -- you're not -- are you aware of any dissimilarities between the -- the in situ formation water and the injectate that you are planning on injecting?

THE WITNESS: I would have to defer to Tyler on that. I'm not aware of any.

TECHNICAL EXAMINER LAMKIN: I believe those are all my follow-up questions. Thank you.

HEARING EXAMINER ORTH: All right. Thank you,

Mr. Lamkin. First let me ask if you have know follow-up for Mr. Johnson.

MR. MANI: Yes. I have a couple of questions for follow up, if I may.

HEARING EXAMINER ORTH: Yes.

REDIRECT EXAMINATION

BY MR. MANI:

Q. Mr. Johnson, with the Bitsy being, being used at approximately 60 to 70 percent pressure capacity, which was your testimony, is it Foundation's goal to attempt to meet or exceed the max pressure, surface injection pressure that's allowed into Bitsy?

A. No. We don't plan to do that.

Q. All right. And in applying for this additional salt water disposal well, would that alleviate or reduce the likelihood of injection pressures on the Bitsy from approaching maximum surface injection pressures?

A. Yes. It would alleviate it.

Q. The -- is it -- is it primarily -- I guess -- let me see how to phrase this. The current quantity of salt water that's being disposed of into the Bitsy is based on the older completions, and that to the extent Foundation has additional re-completions, it is anticipated, not certain, but anticipated that the volume of salt water that will need to be disposed of will be of a quantity that could meet or

exceed that which is capable of being injected into the Bitsy, presently?

A. Yes, I -- we anticipate roughly one more re-completion we would exceed the limit in the Bitsy, to answer your question, and that would require another SWD after, roughly one re-completion.

Q. And again, thus the need for the Blue Quail Fed to be available as a salt water disposal well?

A. Yes. Correct.

Q. All right. Thank you.

HEARING EXAMINER ORTH: Thank you, Mr. Mani. I did see Mr. Pansa appear here on the screen. I believe he might be presenting himself for response to Mr. Lamkin's question. Would you object to Mr. Pansa reappearing to respond to two of Mr. Lamkin's questions?

MR. MANI: No.

HEARING EXAMINER ORTH: All right. Mr. Lamkin, if you would come back on the line. If you remember your questioning of Mr. Johnson, he deferred to Mr. Pansa. Would you re-ask those questions.

TYLER PANSA

(Previously sworn, was recalled and testified as follows:)

EXAMINATION

TECHNICAL EXAMINER LAMKIN: Sure, thanks. One of them was, are you aware of any negotiations between

Foundation and Devon outside of using their disposal well that has made an attempt to come to compromise?

MR. PANSA: Yes. From my recollection, we had a phone call with some employees from Devon when received the protest, and we asked if there was anything that we could come to, like a max disposal quantity to avoid any pressuring up concerns, or you know, a delay of a year so they could get their very close wells drilled or anything like that, and they indicated -- Devon indicated that there was no room for negotiation on their side in any of those, any of those situations and suggested that we drill a 16,000 foot well.

TECHNICAL EXAMINER LAMKIN: Okay. And then are you aware of any dissimilarities between the formation water and the injectate as far as corrosivity content?

MR. PANSA: I'm not aware of any. As I mentioned before, I have not seen a Bell Canyon water analysis from anywhere very nearby this field because we don't have any Bell Canyon production, and there is not any Bell Canyon production very nearby. So I would need to see that analysis to be able to comment on that and compare them.

If it's very important, we could get a -- that could be a stipulation of the permit, that we could get a water sample, if that is a key issue with the state.

TECHNICAL EXAMINER LAMKIN: Very good, thank you.

Thank you very much.

HEARING EXAMINER ORTH: All right. Thank you, Mr. Lamkin and Mr. Pansa. Let me pause for a moment and see if those questions from Mr. Lamkin have raised question by others.

(No audible response.)

HEARING EXAMINER ORTH: No? Is that all Mr. Mani?

MR. MANI: That concludes our testimony.

HEARING EXAMINER ORTH: Thank you. Thank you, Mr. Pansa, for presenting yourself again.

MR. PANSA: Yeah, sure.

HEARING EXAMINER ORTH: All right. We will move then to Devon's presentation. We can certainly take a lunch break if you would like before we get to Devon's presentation. Or, Mr. Rankin, you can get through, I imagine, get through one witness before we break for lunch. What's your pleasure.

MR. RANKIN: Madam Hearing Officer, because I didn't intend to provide any summary testimony, my intent would be to simply have the witnesses adopt their written testimony and then admit their exhibits, I could certainly proceed to get that done now before lunch and take a break or cross and then resume at that point. I think that's certainly an option, if you would like to do it that way, we

can do our witnesses and get our exhibits admitted.

HEARING EXAMINER ORTH: Okay. All right. Let's do that. I think I hear others who maybe need to mute themselves. All right. If you would, please, ask your three witnesses to join us here, and I will swear them in.

MR. RANKIN: Thank you, Madam Examiner. I believe, hopefully, all three of our witnesses are on line.

HEARING EXAMINER ORTH: I see them. Thank you. So this is Katie Adams, Derek Ohl and --

(Audio interference.)

HEARING EXAMINER ORTH: One of you might have to --

(Audio interference.)

HEARING EXAMINER ORTH: Is that you Mr. --

WITNESS: Do I need to mute myself?

HEARING EXAMINER ORTH: So I will swear you in, but then you are going have to mute when you are not speaking; there is a lot of interfering noise.

So if the three of you, please, would raise your right hand. Do you and each of you swear or affirm that the testimony you are about to give will be the truth, the whole truth and nothing but the truth?

MR. OHL: I do.

MR. BERNHARD: I do.

MS. ADAMS: I do.

HEARING EXAMINER ORTH: Thank you very much. That was all three witnesses, Irene. Mr. Rankin?

MR. RANKIN: Thank you, Madam Hearing Officer. I would like to call Devon's first witness, Ms. Katie Adams.

KATIE ADAMS

(Sworn, testified as follows:)

DIRECT EXAMINATION

BY MR. RANKIN:

Q. Ms. Adams, would you state your full name for the record?

A. Katie Adams.

Q. Have you previously testified before the Division?

A. Yes.

Q. Have your credentials in petroleum land matters been accepted and made a matter of public record?

A. They have.

Q. And are you familiar with the application that was filed by Foundation Energy Management in this case?

A. Yes.

Q. And have you prepared direct written testimony that was previously submitted and filed with the Division?

A. Yes.

Q. Was that marked as Devon Exhibit A?

A. Yes.

Q. Did you also prepare yourself some additional exhibits that were attached to your direct written testimony?

A. Yes.

Q. Were those marked as Exhibit A-1 through A-4?

A. Yes.

Q. And were those exhibits prepared by you under your direct supervision and do they constitute Devon business records?

A. Yes.

MR. RANKIN: Madam Hearing Officer, at this time I would like to admit into the record Devon Exhibits A and A-1 through A-4 into the record.

HEARING EXAMINER ORTH: Thank you. Let me pause for a moment in the event there are objections.

(No audible response.)

HEARING EXAMINER ORTH: Exhibits A and A-1 through 4 ARE admitted.

(Exhibits A, A-1 through A-4 admitted.)

MR. RANKIN: Thank you very much, Madam Hearing Officer. I understand the intent here would be to excuse Ms. Adams so that we can do the same with our subsequent witnesses, but that she will be recalled for cross.

HEARING EXAMINER ORTH: Yes, exactly.

MR. RANKIN: Okay. Thank you very much, Ms.

Adams. I guess I can say it, you may be excused.

Next witness then we would like to call is Mr. Derek Ohl.

DEREK OHL

(Sworn, testified as follows:)

DIRECT EXAMINATION

BY MR. RANKIN:

Q. Mr. Ohl, would you state your full name for the record and spell your last name for the benefit of the court reporter.

A. Derek Ohl, O-h-l.

Q. Mr. Ohl, have you previously testified before the Division?

A. Yes, sir.

Q. You are a petroleum geologist with Devon Energy Production Company?

A. Yes, sir.

Q. And have you -- have your credentials as an expert witness in petroleum geology previously been accepted and made a matter of record with the Division.

A. Yes, sir.

Q. And have you prepared yourself some direct testimony that was filed previously with the Division?

A. Yes, sir.

Q. And that's been marked as Devon Exhibit B?

A. Yes, sir.

Q. Did you also prepared some additional exhibits that were attached to your direct testimony?

A. Yes, sir.

Q. Were those marked as Exhibit B-1 through B4?

A. Yes, sir.

Q. And do the exhibits you prepared, B-1 through B-4, were they prepared by you, under your direct supervision or do they constitute Devon business records?

A. Yes, sir.

MR. RANKIN: At this time I would move the admission of devon Exhibit B and B-1 through B-4 into the record.

HEARING EXAMINER ORTH: Thank you. Let me pause for a moment in the event there are objections to Exhibits B or B-1 through B4.

(No audible response.)

HEARING EXAMINER ORTH: No? B and B-1 through B-4 are admitted.

(Exhibits B, B-1 through B-4 admitted.)

MR. RANKIN: Thank you very much. I understand Mr. Ohl will be called back for cross after we break for lunch.

HEARING EXAMINER ORTH: Thank you, Mr. Ohl, you are excused until after lunch.

MR. RANKIN: Madam Hearing Officer, our last witness is Mr. Alex Bernhard.

ALEX BERNHARD

(Sworn, testified as follows:)

DIRECT EXAMINATION

BY MR. RANKIN:

Q. Alex, are you there?

A. Yes.

Q. State your full name for the record and spell your last name for the benefit of the court report?

A. Alex Bernhard, and it's spelled B-e-r-n-h-a-r-d.

Q. And what is your position with Devon Energy Production Company?

A. Senior land engineer.

Q. And have you previously testified before the Division and had your credentials as an expert in drilling engineering accepted as a matter of record?

A. I have not.

MR. RANKIN: Madam Hearing Officer, I understand that we have stipulated to the credentials and expertise of each of our witnesses, so at this time I would ask that the Division recognize Mr. Bernhard as an expert in drilling engineering?

HEARING EXAMINER ORTH: I share your understanding. He is so recognized.

Q. Mr. Bernhard, have you prepared written testimony, direct testimony that was filed in this case?

A. I did.

Q. Was it marked as Devon Exhibit C?

A. Yes.

Q. Did you also prepare exhibits in support of your testimony?

A. Yes.

Q. Were those marked as Devon Exhibits C-1 through C-4?

A. Yes.

Q. And did you prepare those exhibits, or were they prepared under your direct supervision or constitute Devon business records?

A. Yes.

MR. RANKIN: Madam Hearing Officer, at this time I would move the admission of Devon Exhibit C and C-1 through C-4 into the record.

HEARING EXAMINER ORTH: Let me pause for a moment in the event there are objections.

(No audible response.)

HEARING EXAMINER ORTH: Exhibits C and C-1 through C-4 are admitted.

(Exhibits C, C-1 through C-4 admitted.)

MR. RANKIN: Thank you very much. Madam Hearing

Officer, at this time I pass my three witnesses for cross-examination after we break for lunch, as I understand.

HEARING EXAMINER ORTH: All right. Thank you, Mr. Bernhard, you are excused until after the lunch break. How long would you like for lunch, Mr. Rankin? I would say at least 30 minutes, if not longer.

MR. RANKIN: I'm happy with 45 or an hour since we are not trying to do a rulemaking and suitable for everyone's digestive systems, I presume.

HEARING EXAMINER ORTH: All right. Mr. Mani, any opinion?

MR. MANI: If we could do an hour, that would be helpful. There is quite a bit of ice and snow around and nothing nearby to pick up for lunch.

HEARING EXAMINER ORTH: Let's come back at ten to 1. Thank you all very much.

(Lunch recess taken.)

HEARING EXAMINER ORTH: I guess we haven't talked about whether you wanted to present all three of your witnesses together for cross or not. What's your preference?

MR. MANI: If possible, I would like to address each one of the witnesses in order one at a time and move on to the next. Does that sound reasonable?

HEARING EXAMINER ORTH: That's fine. So Ms. Adams, if you would join us, please.

MR. RANKIN: Madam Hearing Officer, I think at this time I was passing witnesses for cross to Mr. Mani, so maybe direct your instruction to Mr. Mani to proceed; right?

MR. MANI: Thank you.

KATIE ADAMS

(Previously sworn, is recalled and testified as follows:)

CROSS-EXAMINATION

BY MR. MANI:

Q. Hi, Ms. Adams. I'm going to be referring to your direct testimony, some of the various paragraphs, and I would like to start with, I guess, some things you put in Paragraph Number 8.

You testified that the Bitsy Federal Salt Water Disposal Well was converted to an injection well in 2008. There was an administrative order accompanying that, obviously. The disposal, the authorized disposal zone was from 4660 to 6270 feet below the surface.

Are you aware of what actual zones the Bitsy is receiving injection water through perforation?

A. I am not.

Q. All right. You also testified that the Bitsy Federal -- I'll just call it the Bitsy -- had received 3.4 -- has received approximately 3.4 million (audio

interference) of produced water into the (audio interference) formation?

REPORTER: I'm sorry, I'm getting a lot of feedback.

HEARING EXAMINER ORTH: There is feedback coming from your audio somehow. I'm not sure if you have a way of adjusting that or you need to mute yourself while Mr. Mani is speaking.

(Discussion regarding audio interference.)

HEARING EXAMINER ORTH: Try again, Mr. Mani.

MR. MANI: If not, we will send a text or something to Mr. Johnson to see if he will activate the mute.

BY MR. MANI:

Q. The Bitsy Number 1 well, you testified, has received approximately 3.4 million barrels of produced water into the Delaware formation. Do you, in fact, know that the injection is into the Delaware formation or into a different formation?

A. My understanding is that it's within a zone in the Delaware formation which comprises multiple zones which my geologist would be able to speak to in more detail.

Q. All right. Let's move on to your Paragraph 9. You testified that Devon plans to drill and develop proposed wells over the next five years. Approximately or exactly,

how many wells is Devon proposing?

A. We don't have an exact number right now. What I showed on my Exhibits A-1 through A-3 is a pretty good idea of our near-term development plans. Those lines in magenta are either affirmative wells or wells we have recently submitted APDs on.

Q. How many applications to drill have been approved of those proposed wells?

A. I don't know offhand. I believe all of the magenta lines in Section 7 have been approved, and they should be on the NMOCD website.

Q. And of the wells that are being approved, how many have been budgeted by Devon and approved?

A. We've got several wells on our schedule currently, Boundary Raider wells and Frieda wells. I don't have the number offhand of the two.

Q. Have you all prepared AFEs and sent those out to your partners already?

A. We have not. We have a JOA in place in one partner in the Boundary Raider wells, and it only requires us to send our proposals 30 days in advance. And then the Frieda wells we own 100 percent of the planned zones.

Q. On the plans that Devon has, is this to fully develop the prospective horizons over the next five years or within the next five years?

A. Essentially, yes. The maps that I provided don't show all of the horizons that are potential to be developed, and my geologist will speak more to those prospective zones, but this does show plans that we have put together and that are more (unclear).

Q. All right. In Paragraph 10 of your testimony, you testified that, Foundation's injection into the Blue Quail Federal Number 1 will adversely impact Devon's planned Bone Spring and Wolfcamp drilling development program. And you go on to state it's because Devon will have to drill through Foundation's injection interval.

A. I will defer to Alex, my drilling engineer, to respond on that, but that is my understanding.

Q. All right. Is it possible for Devon to drill any of its proposed wells in the area of review which wells will have vertical sections that do not go through the Delaware Mountain Group or any of its individual components?

A. Do you mind repeating the question again?

Q. Sure. Can Devon drill any of its proposed wells in the area of review where the vertical sections of such wells will not intersect the Delaware Mountain Group or its constituent formations?

A. So you are asking if any of the wells we have planned won't traverse the Delaware Mountain Group in our drilling?

Q. Yes.

A. I think all of our wells planned will go through the Delaware in order to reach our prospective zones, but I will defer to drilling on that.

Q. All right. Has Devon drilled any wells already within the area of review that penetrated the Delaware Mountain Group?

A. Yes.

Q. Which well?

A. We have drilled several wells in the area, and all of wells we have already drilled are depicted on my exhibits with blue lines.

Q. All right. And then what is Devon's time line to drill the wells -- sorry, let me start the question over.

Does Devon have a time line to drill the wells whose vertical sections will intersect the Bell Canyon formation within, say, let's start with 200 feet of the Blue Quail Fed Number 1? What are Devon's -- what's Devon's time line for drilling those wells that will be closest to the Blue Quail Fed Number 1.

A. From looking on the map right now, those wells are not on our 2021 schedule, but they are in our five-year horizon, and depending on several factors they could be within two years or within five years.

Q. All right. Are you aware of any negotiations

between Devon and Foundation for the salt water disposal into Devon's Sand 18 Fed Salt Water Disposal Well?

A. Yes.

Q. And when did those negotiations occur?

A. I believe at the end of 2019, we initially protested this authorization to inject on the Blue Quail and recently after that we proposed our application to inject in the Sand 18 Well just to the south of this in Section 18 and protested that application. So we had conversations in regards to both of those protests, Foundation's and Devon's.

Q. What was the result of Foundation's protest?

A. As I recall, we ended up taking our application to hearing, and Foundation did not show up to protest and the application has been approved in the Devonian injection plans.

Q. All right. What was the result of the negotiations between Devon and Foundation regarding Foundation's disposal into Devon's Sand H Fed?

A. I put someone in Foundation in contact with our marketing professional who handles water in this area to explain the rates that we were proposing. And as I understand, that negotiation did not amount to anything and we could not agree on a fair price per barrel of water.

Q. Were you aware of any offers, counter-offers made back and forth before negotiations ceased?

A. I believe the initial offer that Devon made at the time was 80 cents per barrel of water, and I think that Foundation counter-offered 35 cents per barrel of water, and I'm not sure if there was any conversations between those two rates. At that point it was handled by my marketing professional.

Q. All right. Thank you very much.

MR. MANI: That's -- that's the last question I have. Pass the witness.

HEARING EXAMINER ORTH: Thank you, Mr. Mani. Mr. Ames, do you have questions of Ms. Adams?

MR. AMES: I do not, Ms. Orth, thank you.

HEARING EXAMINER ORTH: All right. Thank you. Mr. Lamkin, do you have questions of Ms. Adams?

TECHNICAL EXAMINER LAMKIN: I don't believe so, no, thanks.

HEARING EXAMINER ORTH: All right. Would you say that louder, please, it was hard to hear you.

TECHNICAL EXAMINER LAMKIN: I don't believe so. Thank you.

HEARING EXAMINER ORTH: All right. Thank you. Mr. Rankin, do you have any follow-up with Ms. Adams?

MR. RANKIN: I do not.

HEARING EXAMINER ORTH: All right, thank you. Thank you very much, Ms. Adams. You are excused.

MS. ADAMS: thank you.

HEARING EXAMINER ORTH: So we will turn then to Mr. Ohl. Mr. Ohl, would you join us, please. There you are. Mr. Mani whenever you are ready.

DEREK OHL

(Previously sworn, was recalled and testified as follows:)

CROSS-EXAMINATION

BY MR. MANI:

Q. Hello, Mr. Ohl. I have some questions regarding your direct testimony. In Paragraph 4 of your Exhibit B, you discuss how Foundation proposes to inject water into the Blue Quail Fed insofar as a limited portion being the Bell Canyon formation, and then you discuss a little bit more about the Delaware Mountain Group and its component members.

What is your understanding, the Delaware Mountain Group being the geologic group of formations, what is your understanding of its component members as far as just their names? I guess let's start there.

A. In terms of --

Q. The formation names, please.

A. Okay. The Bell Canyon is the uppermost formation. The Cherry Canyon is the middle formation, and Brushy Canyon is the bottom formation within the Delaware Mountain Group.

Q. And above the Delaware Mountain Group, what

strata is that?

A. You have the Lamar.

Q. And above the Lamar?

A. The salt section.

Q. How would you characterize the Lamar and the shallower, I believe it's the Castile and the Salado formations as far as reservoir potential?

A. Zero reservoir potential.

Q. Porosity and permeability in those respective formations, is there any?

A. Well, yeah, none.

Q. Would you consider those effective seals, stratigraphic seals impermeable --

A. Yes.

Q. -- with the -- I'm sorry, I interrupted you.

A. No, you are good. I said yes.

Q. All right. Thank you. As for the Delaware Mountain Group, I believe Mr. -- you believe you classified it as siltstone -- comprised of siltstone and sandstone and also saying -- I'm sorry, let me back up a little bit. I'm going to be referring to several questions from your Paragraph Number 7 in your testimony.

A. Okay.

Q. All right. You characterize the Delaware Mountain Group as comprised of mostly siltstone and

sandstones, also saying that these generally have high porosity and permeability within them. Is that correct?

A. Yes, sir.

Q. All right. And then the type of deposits I believe Mr. Pansa called them turbidity deposits or turbidites. Do you concur with that classification?

A. Yes, sir.

Q. All right. And as such, what are the nature of the sands and siltstones in turbidite sequences?

A. In terms of grain size or --

Q. Let's start off with maybe thickness. Are they alternating sands and silts and shales?

A. No. So your turbidites are the sandstones, and they can be tens of feet thick upwards to nearly 100 feet thick, comprised of multiple flows, mostly sand derived. And then the siltstones are the potential settling of the finer grain matrix behind the turbidity current that lay over the top.

Q. Would the sequence be considered laminated?

A. Different parts within flows can be laminated, yes.

Q. So laminated in a sense of containing thin horizontal bedding plains or bedding surfaces between the component lithologies?

A. Yes, a mixture of both sand and silt.

Q. All right. An injection into sands of this nature, will that be -- would that reservoir contain characteristics that are desired for an injection, salt water injection purpose?

A. Yes.

Q. All right. In your Paragraph 7, second sentence, you state, "There are no geological barriers or impermeable zones within the Delaware Mountain Group to control or limit the dispersion of produced water within the Delaware Mountain Group once its injected into the Bell Canyon as Foundation proposes to do."

With the character of the sands being horizontally extensive and being of good receipt, a good formation to receive injected fluids, what vertical limits between the -- what distinguishes between the three different formations? What are the characteristics of the rocks that will allow you and other geologists to distinguish between the three different formations?

A. They are very similar, and in order to distinguish between the three different zones, there is usually a hotter gamma ray interval between each of those packages.

Q. So three similar sand packages or sediment packages like repeating sections with a gamma ray, where, at the base or at the top?

A. At the top.

Q. All right. What's the significance of a gamma ray signature?

A. It would be higher siltstone thicknesses, and therefore slightly lower porosity rock.

Q. Would, would that gamma ray, higher gamma ray section be indicative of shale?

A. Potentially it's more a silt, finer grain silts and muds. I would not classify it as a shale.

Q. All right. On a gamma ray log, are shales considered the high gamma ray signatures and sands lower gamma ray signatures?

A. They can be.

Q. In this instance, are they?

A. I would not classify them as shale. I would classify them at siltstones, very fine grain silts.

Q. What else could give a gamma ray signature, high gamma ray signature?

A. Mineralogy is really the main make up.

Q. Like a radioactive zone or a -- of sort?

A. Sure, minerals that give off gamma rays.

Q. Okay. In looking at the Delaware Mountain Group in these gamma ray signatures which apparently are markers in between the various formations, does, does the existence of the gamma ray zones allow for accurate mapping of the

contact between the various formations to a lateral -- to a lateral extent?

A. Yes, sir.

Q. All right. Would those, would those hotter zones be present across, consistently present across the area of review?

A. With the well control, I can only speak to that, yes.

Q. Did you -- to me it sounds like you've probably prepared cross sections. Did you prepare well log cross sections correlating these particular zones?

A. Yes, sir.

Q. All right. And did you -- were you able to correlate and distinguish between the three different formations within the Delaware Mountain Group?

A. Yes, sir.

Q. All right. How, back to the gamma ray zones, what's the -- tell me about the thicknesses of those. What were your observations as far as the distinguishing thicknesses?

A. The ones that I said were major formations?

Q. Yes, please.

A. On the order of ten to 30 feet.

Q. So ten to 30 feet of high gamma ray reactive zone, is that what one could consider as impermeable

barriers between the respective formations?

A. No.

Q. But those particular zones, you testified, would have finer grains including muds?

A. Low perm does not mean impermeable.

Q. Are there any faults, structural faults in the area that would break the Delaware Mountain Group vertically?

A. Not that we have seen.

Q. Micro fractures that you're aware of within the Delaware Mountain Group causing vertical migration?

A. That is a potential migration pathway, but I don't have any image logs or anything to specifically say that they are present in the Delaware. In this area.

Q. All right. Have you compiled any -- any isopach maps of any low perm zones within the Delaware Mountain Group?

A. No, sir.

Q. All right. At the base of the Delaware Mountain Group what do you find as far as lithology and lithology changes to exit that particular environment.

A. As you exit the Delaware Mountain Group you get into the carbonates of the Upper Bone Spring.

Q. All right. What is the very -- is there a sealing formation at the top of the Bone Spring between it

and the Delaware Mountain Group that prevents migration of oil and gas vertically?

A. Potential carbonates and the First Bone lime at the top would potentially seal.

Q. Is there an effective seal at the top of the Bone Spring Formation before the Delaware Mountain Group?

A. Can you define effective?

Q. An impermeable zone that would prevent oil or gas migration from out of the Bone Spring vertically into the Delaware Mountain Group.

A. No.

Q. Does -- Devon has drilled some wells in the area, some Bone Spring wells or Wolfcamp wells in the area; is that correct?

A. Yes, sir.

Q. And where does Devon set its intermediate casing?

A. It depends on how close we are to offset completion and injection, but it is usually somewhere top of the Delaware or the Bell Canyon, and within the top couple of feet of the First Bone lime.

Q. That's a -- I'm sorry, that's quite a distance. You said it -- okay. In the wells that were drilled in the area, where did Devon set its intermediate casing?

A. I would have to look, I would have to look at a specific one, but throughout the years we have set them

between the top of the Delaware and the upper part of the First Bone lime.

Q. And setting the casing so that it sits at the top of the limestone at the base of the Delaware, top of the Bone Spring, that's a good footing, good place to set casing?

A. Yes.

Q. All right. And you have done that, and Devon has done that in their, I believe it was the Raider, the Boundary Raider well?

A. I don't know.

Q. All right. I guess continuing in with your testimony under Paragraph 7, how do you interpret, or how do you believe that waters will make its way -- waters injected into the Bell Canyon will make its way through 3500, plus or minus, feet of stratigraphy, across various perm barriers to adversely impact Devon's rights in the Bone Spring?

A. I don't think that the water has to go through perm barriers. I do not recall calling them barriers, but as the water migrates out it will want to migrate down. Also, it can migrate just through the rock. There is potential for natural fractures, and then the potential of migration from behind pipe of existing wellbores.

Q. But you testified you weren't aware of any natural fractures or fracturings or vertical faulting in

this area of review; correct?

A. Because I do not have data to show it, but it is a possibility.

Q. What's the -- what's the most likely path of any objective water in the Bell Canyon? Is it going to be vertically or horizontally?

A. Horizontally.

Q. To what extent? Some? Most? Virtually all?

A. I don't have an answer for that.

Q. So Devon's plans to develop the Bone Spring in the area, I believe 20 or more wells will be drilled through the Delaware Mountain Group in order to reach its Bone Spring or deeper potential; is that correct?

A. Yes, sir.

Q. And over the next five years, thereabouts, give or take?

A. Yes, sir.

Q. How many of those wells -- do any of those wells get drilled without passing through the Delaware Mountain Group or the injection zones.

A. No, sir.

Q. All right. What adverse pressure conditions or water conditions has Devon experienced with the drilling of its Boundary Raider wells?

A. I will defer that to our drilling engineer, Alex.

Q. What would be an easy solution to avoid any influx of potential water? Would it be sufficient to set casing maybe at the base of the Delaware Mountain Group at about 6000 feet?

A. Can you restate?

Q. I'm trying to understand why Devon has already drilled the Boundary Raider wells and set its intermediate casing at 6000 feet. I'm just wanting to understand what -- if that was in consideration -- if that was taking into consideration that injection fluids are have already been injected into the Bitsy.

A. Yes.

Q. All right. Have you calculated the number of barrels of water that may be needed to be injected before a an over-pressure situation which is significant enough to either measure or overpower drilling mud weight occurs?

A. No, sir. That is not my area of expertise.

Q. How long would it, at 1000 barrels a day say max injection pressure or max injection rate at the Blue Quail Fed, how long would it take to, to inject the same amount of fluid that's already being injected into the Bitsy Number 1?

A. That would be determined on Foundation's injection rate.

Q. But if it was at max 1000 barrels a day.

A. So the to get to the 3.5 million? Is that what

you are asking?

Q. Yes, sir.

A. Eight-ish years.

Q. Be about eight years? Take about 3400 days?

A. It would, yeah. Yeah, eight-ish wells -- or eight-ish years.

Q. And Devon plans to develop all of its wells within the next five or so years, hopefully?

A. Hopefully, yes.

Q. So at that rate, the Blue Quail Fed won't even have as much water injected into it as the Bitsy already has.

A. That is correct.

Q. Until three or so years after Devon's ultimate development plans come to fruition, hopefully. Is that correct?

A. Yes, sir.

Q. All right. Let me -- give me just one second. I have another question here, but I'm not sure I need to ask it.

Going back to the Delaware Mountain Group, we're aware that -- I'm sorry. There has been testimony that the Brushy Canyon produces oil in the area of review. Is that correct?

A. On my testimony, or --

Q. No. That Mr. Pansa's testimony was that there are wells that have produced out of the Brushy Canyon in the area of review.

A. Yes, sir.

Q. All right. I suppose my final question is, how does the oil in the Brushy Canyon formation of the Delaware Mountain Group remain trapped within that formation if there's unlimited vertical and horizontal migration of water?

A. Can you restate?

Q. Right. Given that there's -- given that there's oil production in the -- I'm sorry, I was confused as to why Mr. Rankin came back up on the screen.

MR. RANKIN: I was getting ready to object.

Q. Given that there's Brushy Canyon production in the area of review, how does the oil in the Brushy Canyon remain trapped without impermeable layers?

A. It's not trapped by impermeable layers. There is no such thing as an impermeable layer within the Delaware Mountain Group strata.

Q. Are the traps, are the oil traps structural traps then? Are the Brushy Canyon traps structural traps or are they stratigraphic traps?

A. They would be stratigraphic traps.

Q. And what prevents oil migration in a

stratigraphic trap?

A. Lower permeability.

Q. Which prevents migration vertically; is that correct?

A. Slow, potentially slows it down.

Q. All right. Mr. Ohl, I don't have any additional questions. Thank you for -- thank you for your testimony. Thank you for answering what I hope were some tough questions.

MR. MANI: I pass the witness.

HEARING EXAMINER ORTH: all right. Thank you, Mr. Mani. Mr. Ames, do you have questions of Mr. Ohl?

MR. AMES: No questions for Mr. Ohl. Thank you.

HEARING EXAMINER ORTH: Thank you. Mr. Lamkin, any questions for Mr. Ohl?

TECHNICAL EXAMINER LAMKIN: I have a couple of questions.

HEARING EXAMINER ORTH: You are going to have to speak up, Mr. Lamkin.

TECHNICAL EXAMINER LAMKIN: I have a couple of questions for you. So I read, I believe it was in your statement, that Devon is concerned with premature abandonment of resources due to hydrogen embrittlement; is that correct?

THE WITNESS: I do not remember that being in my

testimony.

TECHNICAL EXAMINER LAMKIN: Was that -- it might not have been yours. Somebody, I believe, from Devon had made mention of that.

MR. RANKIN: Mr. Lamkin, just to assist, that would be Mr. Alex Bernhard who is next who made statements about hydrogen embrittlement.

TECHNICAL EXAMINER LAMKIN: That might be a better question for him. Do you happen to know if there are any incompatibilities between formation waters and proposed injectate?

THE WITNESS: I do not.

TECHNICAL EXAMINER LAMKIN: I believe that's all the questions I have.

HEARING EXAMINER ORTH: All right. Thank you, Mr. Lamkin. Mr. Rankin, any follow-up?

MR. RANKIN: None, Madam Hearing Officer.

HEARING EXAMINER ORTH: All right, thank you. Thank you very much, Mr. Ohl. You are excused. And the third Devon witness, Mr. Bernhard, if would you join us please.

HEARING EXAMINER ORTH: Mr. Mani, whenever you are ready.

ALEX BERNHARD

(Previously sworn, was recalled and testified as follows:)

CROSS-EXAMINATION

BY MR. MANI:

Q. Good afternoon, Mr. Bernhard, I will be referring to a few paragraphs from your direct testimony. The question to start with, though, was brought up at the end of cross with Mr. Ohl was hydrogen embrittlement. I have not heard of that, and please tell me about that and how you know about that.

A. Yeah. So hydrogen embrittlement is something that goes into our casing design with a hardness between anywhere from L80 to P-110 pipe. It occurs when hydrogen ions enter the metallurgy and rejoin become H2 or just general hydrogen that can cause stress cracking within the casing. And it occurs in an H2S environment based on the parts per million of the H2S and also the partial pressure of the H2S.

Q. From what I have read, it's in a manufacturing process, manufacturing (unclear)?

A. That's incorrect. It occurs in the environment downhole, the hydrogen embrittlement itself.

Q. Are there other steps that can be taken to mitigate that or prevent that such as coatings on casings?

A. There are, but they are expensive.

Q. And at what concentration of H2S does it begin to have an effect?

A. That's dependent on the partial pressure of the H2S.

Q. Is the -- is the Delaware Mountain Group considered a sour oil or sour gas formation?

A. H2S does exist, but not current concentrations that warrant us to modify our casing design.

Q. All right. Thank you. And another question, so another line of questioning I had was regarding the managed pressure drilling programs. From what I have read in the past, that was, I guess, developed for off-shore drilling initially and now has -- is finding its way into unconventional drilling. Is that accurate understanding?

A. To the background, yes.

Q. And how is that used in -- it looks expensive and I think some of your exhibits showed substantial expense there related to that, but how is that used, and when is that used in Devon's Bone Springs and Wolfcamp wells?

A. It's used when we can't really get a mud rate that fits within the frac gradient, the frac gradient and as well as the core pressure. So when we are circulating while drilling, the mud weight plus -- or the ECD of the mud weight would exceed frac gradient. But when the pumps are off and we don't have any ECDs on formation, it would allow influx from the formation.

Q. So the managed pressure drilling prevents that,

is that correct (unclear) the influx formation?

A. Correct. It allows us to apply back pressure on an anulus when we shut pumps down for a connection or a trip.

Q. What is the, generally the nature of the mud that's being used at that time? Is it a, is it an overpressure mud, or is it an underpressure mud?

A. Are you referring to Bone Spring or Wolfcamp design wells?

Q. We will just do Bone Spring.

A. It would be -- it would fit within a mud weight window that holds back core pressure but does not exceed frac gradient. So technically it's over pressure because it was above formation core pressure, in situ.

Q. It's a managed pressure drilling -- is it used through all aspects of drilling the wells?

A. No. Only intermediate in areas that have offset SWDs in the Delaware.

Q. All right. So okay. So intermediate -- all right. Where does Devon usually set it's intermediate mode casing in the vicinity of the AOR?

A. For Bone Spring or Wolfcamp?

Q. Bone Spring.

A. The design location of intermediate casing sets at the top of Delaware just below the base of the salt.

That's where we permit all of our wells' set casing initially.

Q. All right. And then in a Wolfcamp well?

A. We set casing 80 to 100 feet above KOP in a Wolfcamp well. That tends to be in the Third Sand or the Third Bone line.

Q. What is KOP?

A. Kick off point.

Q. Before you start doing your --

A. Yes.

(Overtalk.)

Q. In designing a drilling program for either Bone Spring or Wolfcamp wells in the area of review, what precautions does Devon -- would Devon take or has Devon taken to protect against influx of salt water potentially from the Bitsy Fed Number 1?

A. Referring to the Boundary Raider 214 H?

Q. Yes.

A. We did set casing deeper on that one. It did require a sundry with the BLM, which is not always easy to accomplish and cannot always be accomplished based on the area. And also incurs additional cost for cement volumes as well as casing and drilling time with rig time for drilling a 12 and a quarter inch section deeper than we would like to.

Q. Is -- I guess, why do that? Why spend the extra money and the extra expense?

A. Because if we weren't (unclear) an interval, it would be much more difficult to drill subsequent sections.

Q. Given that the Bitsy has already received 3.4 million barrels of salt water, how is that same well design to be avoided in future wells?

A. I'm not sure I follow the question.

Q. Well, the Bitsy Number 1 has already received 3.4 million barrels of salt water. And Devon took precautions in that Boundary Raider 214 to protect against any influx of that salt water. Given the AOR and existence of all the injection that has already occurred, how does it change Devon's plans for future wells? Won't they all have to be designed similarly or is there some other motivation?

A. That's something we are going to have to deploy as an AOR to Bitsy. What we are trying to do here is to prevent having to do that in a different AOR with the Blue Quail.

Q. The proposed injection in the Blue Quail is where compared to the Bitsy?

A. It's in -- the Bitsy is further away from our proposed Boundary Raider and (unclear) that both Derek and Katie referred to.

Q. For an injection, the proposed injection is where

vertically compared to where it is in the Bitsy? Shallower or deeper?

A. Shallower.

Q. All right. Some of the same questions I asked Mr. Ohl. What is Devon's time line to drill their wells which, the vertical sections for which will intersect the Bell Canyon formation within 500 feet or so of the Blue Quail Number 1?

A. That would be a question for Katie and Derek. They are more the planning side than I am.

Q. Would it be more beneficial -- would it be more beneficial if Devon drilled the wells that were in more proximity to the Blue Quail or to the Bitsy? Would it be better to do it earlier than later with injection continuing?

A. Yes.

Q. Have you calculated number of barrels of water that may need to be injected -- sorry, this is a very long question. It's technical, bear with me.

Have you calculated the number of barrels of water needed to be injected before a plume of overpressure significant enough to overpower drilling mud weight in an overbalanced situation exists with the Blue Quail Fed Number 1?

A. I have not calculated that number, but we do have

a case study from the Silverton SWD on that (audio lost).

HEARING EXAMINER ORTH: Mr. Bernhard, you have broken up.

MR. MANI: Looks like he may need to reconnect.

HEARING EXAMINER ORTH: All right. Mr. Bernhard, we will wait for you to reconnect.

MR. RANKIN: Madam Hearing Officer, I'm going to make sure Mr. Bernhard knows we have lost him, and I will send him a text and see if we can get him back on as quickly as possible.

HEARING EXAMINER ORTH: Let's take a ten-minute break while you try to reach him, and as soon as I see him get back on, I will admit him.

MR. MANI: Okay. thank you.

(Recess taken.)

HEARING EXAMINER ORTH: Let's see. When we broke, Mr. Mani was asking a question of Mr. Bernhard. If you would, please, Mr. Mani, repeat your question.

BY MR. MANI:

Q. That's what I was hoping not to do. It was hard enough to get the question out the first time. Took me two tries. I will do it again. There is just a couple of questions left, so I will repeat that one right before we broke.

A. Right.

Q. Have you calculated number of barrels of water needed to be injected before a plume of overpressure significant enough to overpower drilling mud weight overbalance exists with the Blue Quail Fed well?

A. Oh, yeah, got you this time. So, no. To directly answer your question we have not calculated that, but we do have a case study in the area less than two miles away of the Silverton SWD to the north of Boundary Raider development. And it had injected 1.2 million barrels of water and is 900 feet away from our verticals that were drilled, and we did see substantial effects while drilling the vertical.

Q. The formation where that injection was, do you know?

A. The Delaware Mountain Group.

Q. All right. My last question is, how long would it take for an overpressure plume to interfere with drilling operations at the stipulated water disposal well limits, a thousand, a max of a thousand to date?

A. So if we were to use our case study as we did from the Silverton SWD, had an injected a total of 1.2 million barrels per day, and y'all were injecting at 1000 barrels per day, that would be 1200 days, which is less than three years -- or just over three years. About three and a half years, if we were to (audio interference).

Q. And how far away is that case study?

A. 900 feet.

Q. Oh, no. I'm sorry, the Silverton well is located in what township and range, sir?

A. Just north of Section 6 of the Boundary Raider that we are referring to. There was Boundary Raider 6, 7, Fed Com 711H and 611H, and that's just over two miles to the north of us that we are discussing the Blue Quail.

Q. In drilling the Boundary Raider 214, was there any overpressure, significant overpressure, and was the overpressure measured or recognized?

A. Because of where we were drilling the well and setting casing, we are able to maintain a ten plus (unclear) gallon while drilling the interval, and we were fully able to hold back any salt water flows. Had we taken that ten pound brine any deeper than where we set casing, we have highly risked going on full loss returns.

Q. I think that I don't have any additional questions, so thank you very much.

MR. MANI: And at this time I would like to pass the witness.

HEARING EXAMINER ORTH: Thank you, Mr. Mani. Mr. Ames, do you have questions of Mr. Bernhard?

MR. AMES: No, thank you.

HEARING EXAMINER ORTH: Thank you. Mr. Lamkin,

questions?

TECHNICAL EXAMINER LAMKIN: Yeah, I have one question. Are you aware of any operational parameters through the Blue Quail that would be a minimal to Devon?

THE WITNESS: Can you rephrase the question?

TECHNICAL EXAMINER LAMKIN: So is there -- are there any conditions with which you would find it acceptable for them to dispose into the Bell Canyon?

THE WITNESS: I don't believe so. At some point we would reach a certain injection volume of pressure that would influence our drilling programs.

TECHNICAL EXAMINER LAMKIN: Would Devon -- this is probably based on several factors, but would Devon be willing to drill the nearest wells to the Blue Quail further up in the drilling schedule? Or have you considered that?

THE WITNESS: That's above my pay grade. That would probably be more suited for Derek and Katie.

TECHNICAL EXAMINER LAMKIN: Okay. Thank you. That's all the questions I have.

HEARING EXAMINER ORTH: Thank you, Mr. Lamkin. Mr. Rankin, do you have any follow-up?

MR. RANKIN: Thank you, Madam Chair. I do not have any redirect for Mr. Bernhard based on the questioning.

HEARING EXAMINER ORTH: Thank you. Thank you very much, Mr. Bernhard. Thank you for getting back on as

well so quickly. You are excused.

THE WITNESS: Thank you.

HEARING EXAMINER ORTH: Mr. Ames?

MR. AMES: Madam Hearing Officer, Eric Ames for OCD, I would like to call Phillip Goetze.

HEARING EXAMINER ORTH: Do we have Mr. Goetze? Oh, there you are Mr. Goetze. Would you raise your right hand, please. Do you swear or affirm that the testimony you are about to give will be the truth, the whole truth, and nothing but the truth?

MR. GOETZE: I do.

HEARING EXAMINER ORTH: Thank you very much. Whenever you are ready, Mr. Ames.

PHILLIP GOETZE

(Sworn, testified as follows:)

DIRECT EXAMINATION

BY MR. AMES:

Q. Good afternoon, Phil?

A. Good afternoon.

Q. Could you please state your full name for the record?

A. My name is Phillip Goetze.

Q. And how do you spell -- for the court reporter's benefit, how do you spell your last name?

A. My last name is spelled G-o-e-t-z-e.

Q. Phil, have you previously testified in cases involving produced water injection wells?

A. Yes, I have.

Q. Are these wells considered underground injection control wells subject to Part 26 of the OCD's rules?

A. They are.

Q. Have you testified about UIC wells before the OCD and the Oil Conservation Commission?

A. Yes, I have.

Q. In those cases were you recognized as an expert in petroleum geology and UIC wells?

A. I was.

Q. Mr. Goetze, did you prepare testimony for this proceeding?

A. Yes, I did.

Q. Did you prepare exhibits as well?

A. Yes, I did.

Q. Were those three exhibits, one your CV and two others being maps of the area showing various wells and stratigraphy in the area?

A. That's correct, Exhibits 1, 2 and 3.

Q. Were was your testimony and those exhibits attached to the Division's prehearing statement filed in this case last week?

A. They are.

Q. And looking over that testimony and those exhibits, are they a true and accurate copy of the testimony and exhibits you prepared?

A. Yes, it is.

MR. AMES: Move admission of Mr. Goetze's testimony and the three exhibits.

HEARING EXAMINER ORTH: Let me pause for a moment in the event there are objections to the testimony or the three exhibits, 1 through 3.

(No audible response.)

HEARING EXAMINER ORTH: No? Thank you, they are admitted.

(Exhibits 1, 2, 3 admitted.)

MR. AMES: That concludes our direct testimony and I pass Mr. Goetze for cross-examination.

HEARING EXAMINER ORTH: Thank you. Mr. Mani, do you have questions of Mr. Goetze?

CROSS-EXAMINATION

BY MR. MANI:

Q. I just have one question. In your review of the geology and stratigraphy in the area, did you find any impermeable or substantially impermeable barriers above and below the Bell Canyon formation?

A. The evidence presented in the application and the well files show the presence of confining layers both above

and below at the point of which the logs were taken.

Q. All right.

MR. MANI: No additional questions. I will pass the witness, thank you.

HEARING EXAMINER ORTH: Thank you, Mr. Mani. Mr. Rankin, do you have questions of Mr. Goetze?

CROSS-EXAMINATION

BY MR. RANKIN:

Q. Hi, Phil, how are you?

A. Good afternoon, Mr. Rankin.

Q. Mr. Goetze, would you mind giving us a little bit of a higher overview of what the background is in terms of what the concerns are with injecting generally in the Delaware Mountain Group?

A. At this point historically we have had increased issues regarding containment with numerous wells that have used the Delaware Mountain Group as a disposal interval.

Q. And in those circumstances where operators have applied for authorization to inject, have their applications also included testimony that there is no conduits or that the injection zone would be contained within the injection interval -- or the injection would be contained within the injection interval in those cases?

A. We have had testimony to that effect, yes.

Q. But in fact, in some cases that injection has not

stayed within the injection interval within the Delaware Mountain Group?

A. We have had evidence of incidences, yes, of not staying within the interval that was originally permitted.

Q. Okay. In fact, in some case it migrated down to the uppermost members of the Bone Spring underlying the Delaware Mountain Group; correct?

A. We have had a case involving Bobco which has shown demonstration of that, yes.

Q. What other concerns besides migration out of injection zones have arisen with respect to Delaware Mountain Group injection for disposal?

A. Well, the concerns have also been with regards to impacting potential hydrocarbon resources, and for at least impacting existing production. So the issue of waste and correlative rights is always considered when reviewing Delaware Mountain Group applications.

Q. Those are, those concerns are more end (unclear) those are concerns that pertain mostly more directly to potential hydrocarbon production within the Delaware Mountain Group itself?

A. Or adjacent if they reach out and touch. So I mean, we look -- we don't just say waste in one place, we look at waste in the entire stratigraphy.

Q. And that would include impacts to operators

attempting to drill through the Delaware Mountain Group and having difficulties as a result of injection in that zone?

A. We examine those to the extent as to concerns of whether you are able to complete that well or there are safety issues involved with it.

Q. As far as the Division's proposed conditions of approval, did you hear Foundation's testimony that they had agreed or were Conditions 1 through 7 as proposed were acceptable to them?

A. Yeah, I did hear that.

Q. But they had some concerns about condition number 8. Has the Division had an opportunity to, to evaluate concerns Foundation has raised regarding the parameters around implementation of Condition 8?

A. We have considered them.

Q. Does the Division have any idea for timing of when, how that would actually play out or work in terms of what the parameters might be, or would that be a case-by-case basis depending on the situation?

A. We look at it more as a tool as a case-by-case situation in order to have the opportunity to come to the front end of a decision without having to go through a long, arduous process, especially if there are resources or safety issues involved.

Q. Thank you, Mr. Goetze.

MR. RANKIN: I have no further questions.
HEARING EXAMINER ORTH: Thank you, Mr. Rankin. Mr. Lamkin, do you have any questions for Mr. Goetze?
TECHNICAL EXAMINER LAMKIN: I have one question. So for that condition of approval Number 8, like the Division retains the right to rescind a permit based on the impact on correlative rights whether or not somebody protests the well or not; correct?
THE WITNESS: Correct.
TECHNICAL EXAMINER LAMKIN: That's the only question I have.
HEARING EXAMINER ORTH: Thank you, Mr. Lamkin. Mr. Ames, do you have any follow-up for Mr. Goetze?
MR. AMES: I do not, thank you.
HEARING EXAMINER ORTH: Thank you very much, Mr. Goetze.
All right. Gentlemen, counsel, would you like to submit proposed findings or any kind of legal argument, just proposed findings and conclusions after we get the transcript. What are your preferences? Mr. Mani.
MR. MANI: No, Madam Examiner, I just -- the only -- I believe that if there were any concerns over the Requirement Number 8 in the OCD's proposal, it was simply on how to -- what it meant from a legal standpoint, which we are trying to properly discuss with our client, but no

proposed changes or suggestions to any of that at this point.

HEARING EXAMINER ORTH: All right. Would you like to offer a brief closing statement on the transcript, we can do that instead. Would you like to do that?

MR. MANI: Actually, thank you, but I'm not really prepared to do that. I believe our testimony and exhibits show that we need for Foundation's application to be granted, and that's -- we submit to the Commission to approve it, please.

HEARING EXAMINER ORTH: Okay, thank you. Mr. Rankin, anything further?

MR. RANKIN: Madam Hearing Officer, we had prepared a short rebuttal on a couple of points based on the testimony and exhibits that were prepared by Foundation. I'm conferring with my clients right now about whether or not we, you know, feel like we would request to be able to present that. So if you -- if you don't mind, I would like to have the opportunity to have a quick conference with them on a potential short rebuttal.

But as to the closing, I think I would like the opportunity to present a short closing argument, and I think it might be helpful for the Division if we were afforded the opportunity to present proposed findings of fact and conclusions of law from the transcript.

HEARING EXAMINER ORTH: All right. Thank you. Mr. Ames, anything from you?

MR. AMES: Madam Hearing Officer, I would like to make a short closing statement. If Mr. Rankin insists on filing post hearing pleadings, we will as well, but I am inclined to agree with Mr. Mani, it is not necessary.

HEARING EXAMINER ORTH: All right. Thank you. So shall we take just a five-minute break while Mr. Rankin figures out whether he would like to present rebuttal.

MR. RANKIN: Madam Hearing Officer, I have conferred in the intervening seconds and have confirmed that we don't see the need to present rebuttal at this point.

And if I'm outvoted on the request for findings and conclusions, that's fine. It may not be necessary, that's fine, the testimony speaks for itself.

HEARING EXAMINER ORTH: All right. Mr. Rankin, if you would like to offer some closing remarks, I'm happy to hear that. Otherwise, I will turn to Mr. Ames for his closing remarks.

MR. RANKIN: Thank you, Madam Hearing Officer. I will just give a brief closing that I think that we what we heard today was that Foundation is proposing a salt water disposal well for re-completions that it's not sure it will proceed with, number one.

Number two, to the extent it does proceed with

any of the re-completions has not determined the calculated actual need for it based on the existing capacity within its existing Bitsy Federal Number 1 disposal well.

It's already set up to receive produced water from all of its existing production in the area. It has the facilities in place, and it's got, as far as we can tell, the capacity to receive those volumes at the staggered or staged approach that Foundation is proposing.

They have presented no evidence that their injection is going to be maxed out. They have been approached or been able to testify that they have approached injection limitations under their existing well.

So what they are seeking here in our view is the opportunity to avoid having to P and A a junked well, the Blue Quail Number 1 that has a stuck fish tool that they would have to remove in order to P and A it just to protect the integrity of the different zones in the Delaware Mountain Group.

As you heard, it's far more expensive for them to do that than it would be to simply convert it to injection. So I think that, you know, our concern here is that the motivation here is about cost savings and avoiding properly handling a well that's been junked than it is about actual capacity or the ability or need to dispose of its water.

So that's our concern, and I think that the

evidence at this point, anyway, sustains that position. So we ask that the Division deny Foundation's application or, in the alternative, at least adopt the conditions as proposed by the Division.

HEARING EXAMINER ORTH: Thank you very much, Mr. Rankin. Mr. Ames, your closing remark?

MR. AMES: Thank you, Ms. Orth. As the parties I think understand, OCD generally opposes disposal of produced water in the DMG, but it has indicated a willingness to consider an exception for small scale non-commercial disposal such as requested by Foundation in this case when it's required by the operator to produce its own well.

Whether OCD will grant such a request really depends on the facts of the case. Until Wednesday when the parties filed their prehearing statements, OCD did not have Foundation's written explanation of its need for disposal or the precise geology of the injection interval.

We didn't have Devon's explanation of potential impacts to production in the DMG and other horizons and potential impacts to its correlative rights. As expected, both parties have filled out the picture through their testimony, both on direct and in cross.

This evidence will enable the technical examiners to make a recommendation to the division director who will ultimately decide whether the proposed injection will or

will not cause waste or impair correlative rights, the public health or the environment.

Ocd's role here today as a party, and as explained in Mr. Goetze's prefiled testimony is to ensure that the Division director -- that if the Division director decides to grant the application, that her order includes conditions that ensure that the injection will not cause harm, will not cause waste or impair correlative rights, public health or the environment and to provide a mechanism for OCD to review issues as they may arise in a timely and efficient manner.

And with that, I conclude. Thank you.

HEARING EXAMINER ORTH: Thank you, Mr. Ames. Mr. Mani, if you have changed your mind can have the last word here, otherwise, we will adjourn and thank you all have very much.

(No audible response.)

HEARING EXAMINER ORTH: I'm not seeing Mr. Mani. All right. If there is nothing else, we will adjourn. Thank you all very much.

(Concluded at 2:14 p.m.)

STATE OF NEW MEXICO

COUNTY OF BERNALILLO

REPORTER'S CERTIFICATE

I, IRENE DELGADO, New Mexico Certified Court Reporter, CCR 253, do hereby certify that I reported the foregoing virtual proceedings in stenographic shorthand and that the foregoing pages are a true and correct transcript of those proceedings to the best of my ability.

I FURTHER CERTIFY that I am neither employed by nor related to any of the parties or attorneys in this case and that I have no interest in the final disposition of this case.

I FURTHER CERTIFY that the Virtual Proceeding was of poor to good quality.

Dated this 18 day of February 2021.

/s/ Irene Delgado
_____
Irene Delgado, NMCCR 253
License Expires: 12-31-21