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

ORIGINAL

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

APPLICATION OF HIGH ROLLER WELLS, LLC FOR AUTHORIZATION TO INJECT, EDDY COUNTY, NEW MEXICO.

CASE NO. 15278 (De Novo)

REPORTER'S TRANSCRIPT OF PROCEEDINGS

COMMISSION HEARING

May 19, 2016

Santa Fe, New Mexico



BEFORE: DAVID R. CATANACH, CHAIRPERSON
PATRICK PADILLA, COMMISSIONER
DR. ROBERT S. BALCH, COMMISSONER
BILL BRANCARD, ESQ.

This matter came on for hearing before the New Mexico Oil Conservation Commission on Thursday, May 19, 2016, at the New Mexico Energy, Minerals and Natural Resources Department, Wendell Chino Building, 1220 South St. Francis Drive, Porter Hall, Room 102, Santa Fe, New Mexico.

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EXHIBITS OFFERED AND ADMITTED

(9:10 a.m.)

CHAIRPERSON CATANACH: So at this time I will call Case 15278, which is the application of High Roller Wells, LLC for authorization to inject, Eddy County, New Mexico.

Call for appearances.

MR. HALL: Mr. Chairman, Commissioners, Scott Hall, with Montgomery & Andrews Law Firm, Santa Fe, appearing on behalf of the Applicant, High Roller Wells, LLC. We have one witness this morning.

CHAIRPERSON CATANACH: I'm sorry? One witness?

MR. HALL: One witness.

MR. BRUCE: Mr. Chairman, Jim Bruce of Santa Fe representing Mewbourne Oil Company.

MS. MUNDS-DRY: Good morning, Mr. Chairman. Ocean Munds-Dry, COG Operating, LLC. I have no witnesses this morning.

CHAIRPERSON CATANACH: Any additional appearances?

Okay. Can I get all the witnesses to stand this morning, please?

Swear in the witness.

(Mr. Johnston, Mr. Pearson, Mr. Cless and Mr. Cude sworn.)

CHAIRPERSON CATANACH: Counsel, do you want to give any opening statements or go straight to the case?

MR. HALL: Let's go.

CHAIRPERSON CATANACH: Is that okay?

MR. BRUCE: That's fine.

MR. HALL: Mr. Chairman, I would call Rick Johnston to the stand.

RICK JOHNSTON,

after having been previously sworn under oath, was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. HALL:

Q. For the record, please state your name.

A. My name is Rick Johnston.

Q. And where do you live, Mr. Johnston, and by whom are you employed?

A. I live in Austin, Texas. I have a consulting firm by the name of Johnston & Cloud. I'm a consulting petroleum engineer.

Q. All right. You previously testified before the Division and had your credentials as an expert petroleum engineer accepted as a matter of record; is that correct?

A. Yes.

Q. Would you please give the Commission a brief summary of your educational background and work experience?

A. Okay. I graduated from the University of Texas in 1978 with a degree in chemical engineering. When I got out of school, I went to work for Amoco Production Company, worked for them for a few years and have been a practicing petroleum engineer since that time. I'm registered in the state of Texas. I'm not registered in New Mexico.

Q. All right. You're familiar with the lands and the application in this matter; is that correct?

A. Yes.

MR. HALL: At this point, Mr. Examiner -- Mr. Chairman, I'd offer Mr. Johnston as an expert petroleum engineer.

CHAIRPERSON CATANACH: Any objection?

MS. MUNDS-DRY: No objection.

MR. BRUCE: No.

CHAIRPERSON CATANACH: Mr. Johnston is so qualified.

Q. (BY MR. HALL) As a footnote, you're a consultant for High Roller Wells; is that correct?

A. Yes.

Q. Could you tell the Commission just a little bit

about High Roller Wells, how they do business?

A. High Roller Wells is a company that's headquartered out of Center, Texas in East Texas. Over the past three years, I've worked with them, and we have drilled and completed roughly 36 disposal wells in the state of Texas.

The Gossett application, which is the subject of this hearing, is their first well in New Mexico, but they've drilled and completed, like I've said, roughly 36 wells in the Eagle Ford Play, the Permian Play and a number of plays in the Delaware Basin in Loving and Reeves Counties.

Q. All right. And will High Roller Wells, in this particular case, continue to operate the Gossett well?

A. What will happen, if the permit that we seek is issued, is the well will be drilled and completed by High Roller Wells. The facility will be built, and then shortly after the thing goes operational, then a company called NGL Water Solutions out of Denver will take over, assuming that the OCD approves the transfer of the permits to NGL.

Q. All right. Let's get into the substance of High Roller's application. Would you briefly summarize what High Roller seeks in this matter?

A. We seek a permit to dispose into the Delaware

section at the location of the Gossett #1. As a function of time, the interval that we seek for disposal has changed.

And I guess based on the issues that have been raised most recently by the Protestant, I would think that we probably need to go back to our original proposed interval. There are a couple of wells in the half-mile area that if the permit is issued, with the shortened-up interval from 2,600 to 3,200 feet, there are two wells that potentially could be -- or have confinement issues, two wells that have been plugged.

The reason I designed the application originally to go from 2,500 to 5,000 feet was 5,000 feet is deep enough that the plugs in these two wells I'm talking about so confinement issues won't be an issue.

Q. We should get into the record the location of the well. Can you tell us where this well will be?

A. The well will be located in Section 33, Township 23 South, Range 28 East. The calls will be 313 from the south line and 921 from the east line. And what I'm looking at is, in your notebook, what's been marked as Exhibit Number 3. And down at the page -- bottom of each page is a very small number, and I'm looking at page 4, which is the schematic of the well, and it has the calls and the location of the well.

Q. Now, is Exhibit Number 3 the C-108 application for the Gossett well?

A. It is.

Q. All right. Did you assist in its preparation?

A. Yes.

Q. Let's, you know, look at page 4. And just explain the original design and the perforation depths you are proposing.

A. Well, what we propose to do is drill the well to 550 feet, run 10-and-three-quarter inch casing, cement it back to surface. Our review of the water wells in the area indicated that there are no wells obtaining fresh water in the area, that most of the water is in the range of 100 to 200 feet.

We then propose to drill to 5,100 feet, run 7-inch casing, circulate cement back to surface, and then it would be a completed -- a perforated completion. And then we'll set a compression packer within 100 feet at the top of the permitted interval, and we'll run 4-and-a-half inch tubing using N80, and it'll be internally plastic coated.

Q. If we turn to page 8 of the C-108, it's actually marked page 3 in the upper, right-hand corner, page 8 at the bottom, there you refer to the average and maximum injection rates that were originally proposed.

Are you still seeking those rates?

A. No. In the state of New Mexico, the standard permit provision, as I understand it, is to limit the maximum surface injection pressure to a .2 psi per foot. So the top of our interval is at 2,600 feet. Our maximum surface injection pressure will be 520 pounds. That will be the limitation of the amount of water that can be put into the well. I would expect it's probably going to be down on the range of 5- to maybe 6,000 barrels a day with that sort of pressure limitation.

Q. All right. And let's talk about previous administrative history for this application. This application was heard before a Division examiner last April, is that correct, April of 2015?

A. Yes.

Q. And what was the outcome of that hearing?

A. It would have been what's been marked as Exhibit Number 2 in the notebook. A permit was issued that included a maximum rate of 17,500 barrels a day, maximum surface injection pressure of 520 pounds, and a permitted disposal interval from 2,600 feet to 3,200 feet.

Q. All right. If we can refer to Exhibit 1, what does that show us?

A. Exhibit Number 1 is just a little schematic I

put together that shows the original application sought a disposal interval from 2,500 to 5,000 feet. Prior to the hearing, I believe it was COG who indicated that they had a problem with the disposal interval as deep as 5,000 feet. So we amended it in advance of the hearing, the bottom to 4,500 feet, and then the order granted us an interval of 2,600 to 3,200. After we exchanged exhibits, for the first time anybody brought up this confinement issue. That's why we're now saying we probably need to seek a permit from 2,600 feet to 5,000.

Q. All right. So the variable column shown on the far right of Exhibit 1 is what we had in our pre-hearing statement before the parties exchanged exhibits; is that right?

A. Yes.

Q. Okay. So we're seeking to expand from that?

A. Yes, from 2,600 to 5,000 feet.

Q. All right. We refer back to the C-108 on page 8, again, under your Article 7, Section 4 there. There is some reference to some nearby preexisting injection activities; is that right?

A. Yes. There are a couple of wells within a two-mile area that have previously disposed into a portion of the disposal interval that we seek the permit for today.

Q. All right. What do you expect the source of the disposal fluids will be going into the Gossett wells?

A. It'll be the producing wells in the area, and I would expect the majority of the water will come from the horizontal drilling that's going on in the area. The target of that horizontal drilling is the Bone Spring, the Avalon Shale and the Wolfcamp and from the horizontal wells.

Q. Going back to page 4, again, the wellbore schematic, you briefly touched on that. Do you need to expand on that further for the Commission?

A. I don't believe so.

Q. And this will be a perforated completion, correct?

A. Yes.

Q. The fluids will be injected under pressure?

A. Yes.

Q. And will the well be equipped with a back-pressure valve?

A. Yes.

Q. And what materials will you be using for the tubing?

A. The tubing -- well, what I'll refer to as the production casing and the tubing both will be N80-grade

casing, which has a higher level of corrosion resistance than normal J or K grade, and the tubing will be internally plastic-coated.

Q. All right. And you've expressed what you anticipate the rates this well will be able to accept once in operation, but what rates are you asking for the Commission to provide for in the order itself?

A. 8,000 barrels a day.

Q. All right. And the anticipated average maximum injection pressures will be what?

A. Oh, I would expect the average injection pressure's going to range in the 400 -- 400- to 500-pound range, and the maximum will be 520.

Q. All right. And do you anticipate that injection -- that those volumes and pressures will remain within the fracture gradient?

A. Yes.

Q. Is this to be a closed --

A. Well, a better way to say it, it will be below the fracture gradient.

Q. Below.

Will this be a closed or open facility?

A. It will be open in that it will accept water -- it'll be a commercial facility, and they'll accept water from anybody.

Q. Let's turn to page 39, Exhibit 3, the C-108, if you could identify that and discuss the chemical analysis for the injection fluids and their comparability.

A. Well, pages 39, 40, 41, 42, 43 and 44 are analyses of produced water from wells in the area, and you can see that the total dissolved solids on these samples are quite high. The first one is 174,000. The second one is 341,000. The next is 206,000, on page 41. On page 442, it's 128,800. Excuse me. That's chlorides. I don't see TDS. But it's all of the produced water that will be going into this well is very, very salty, with the exception of the frac flowback water. Initially, when you turn one of these horizontal wells on, the frac flowback water has a fairly low total dissolved solid content, and as you continue to produce the well, the chloride content goes up.

Q. Do you anticipate any comparability issues with the formation?

A. No, not at all. This is the same formation that we have other disposal wells down in Texas down in the Delaware Basin, and we're accepting produced water and frac flowback water, and we've not had any compatibility issues there. So I wouldn't expect any

here. It's the same formation, just a little shallower.

Q. Just discuss briefly for the Commission the members that comprise the Delaware Formation in this part of the world.

A. The Delaware is going to -- the shallowest is the Bell Canyon. Then you have the Cherry Canyon, and then you have the Brushy Canyon. It's pretty much layer-cake geology.

Q. And you're anticipating that the Gossett well will penetrate all three?

A. This expanded disposal interval from 2,600 to 5,000 feet will include the Bell Canyon the Cherry Canyon and the upper portion of the Brushy Canyon.

Q. Okay. Again in the C-108, if we refer to pages 7 and 8, there is a chart there beginning at the bottom of page 7, on page 8. What are those?

A. Those are the wells that have penetrated the Bell Canyon and the Cherry Canyon within the half-mile area. And, actually, since this C-108 was prepared, Mewbourne has drilled some horizontal wells for the Bone Spring and the Wolfcamp that would produce these intervals but producing from much deeper horizons.

Q. All right. Let's turn to Exhibit 4. Identify that, please.

A. Exhibit Number 4 is a map that I put together

using updated well data, well spots, as I understand it, were obtained from the OCD. And what I've done is API Number 26798 is very close to the proposed Gossett well. The Gossett's not in the database, so I used that to have the computer draw a half-mile radius circle to identify all the wells within the half mile.

Q. All right. Let's turn to Exhibit 5.

A. So what I did is from Exhibit 4, which the map -- I had -- excuse me. I had Art Hewitt [phonetic] give me a list of the API numbers of all the wells within a half-mile area. Well, actually, let me back up.

If you look at Exhibit Number 6, which is a similar map, except for it's a two-mile radius area, I had the computer go in and identify the API numbers of all the wells within that two-mile area.

I then went to Lasser Production Data Service and had -- had them give me a listing of all the wells, the well data for those wells, and that built the tabulation which is Exhibit Number 7. Exhibit Number 7 is that data sorted by API number.

And then Exhibit Number 8 is the same data, except for I've sorted it by upper perforation.

Q. All right. I understand.

Let's clarify Exhibit 5, though. If we

turn to the C-108, page 34, to what's marked in the C-108 as Exhibit F --

A. Yes. Yes. I'm sorry. I misspoke. What Exhibit Number 5 is is it's an updated Exhibit F to the C-108.

Q. All right. So it captures the new penetrators?

A. It does.

Q. For the wells that are listed on the original Exhibit F, can the Commission find the wellbore schematics for certain of those wells at pages 36 and 38, the C-108?

A. Yes. They're on pages 36, 37 and 38.

Q. And if you look at each of those wells, those are the wells that had been plugged; is that correct?

A. That is correct.

Q. Now, for the new -- the new drills that are shown on updated Exhibit F, have you looked at the completion information for each of those?

A. Yes, I have.

Q. And for all of those wells, were the data sufficient for you to determine the casing depth and to accurately calculate the cement tops and formations?

A. Yes.

Q. Was there any evidence of casing leaks in any of these wells?

A. None was noted.

Q. All right. Are you satisfied that the condition of those wells in the AOR such that none of them will act as a conduit for fluids to freshwater aquifers?

A. I agree with that. That's correct. They're all cased and cemented in such a fashion that injected fluids will not be allowed to escape the disposal interval at those in the wells.

Q. If we turn to pages 45 and 46 of the C-108, are all of the freshwater aquifers in the area identified there?

A. Well, I believe pages 45 and 46 is a listing of all the water wells from the state database within a two-mile area.

Q. And does that chart identify the lowest depths of those wells?

A. Yes. If you look at the depth of the well, the deepest well on the tabulation is 268 feet, about midway down the page.

Q. All right.

A. That's -- we believe that running 550 feet of surface casing will very adequately protect the fresh water in the area.

Q. All right. And what are the wells above the

red line?

A. Those are the wells that are within one mile of the proposed locations.

Q. Are there any known sources of fresh water below the injection interval in this case that you're aware of?

A. No.

Q. What geologic criteria did you utilize to evaluate the injection formation here?

A. A lot of it has to do with my experience working the Delaware Basin in Texas. The Delaware is a sandstone that has generally good porosity development and good permeability.

Q. All right. Have you made the determination that injection operations through the Gossett well, through the interval proposed, won't adversely affect productive -- or potential low-productive areas?

A. Based on what I see, it will not adversely affect productive intervals in the area.

Q. All right.

A. There is production in the lower portion of the Brushy Canyon, but in the interval, the Bell Canyon, the Cherry Canyon and the upper portion of the Brushy Canyon where we propose to dispose, there is no production.

Q. Let's look at Exhibit 6 again.

A. Okay.

Q. You started to get into Exhibit 6. Now let's turn to Exhibit 7.

A. Okay. The purpose of Exhibits 6, 7 and 8 is to take a look at what production is in a two-mile area of the proposed disposal location.

So Exhibit 6 is a map that I used to identify the API numbers of all the wells.

Exhibit 7 is a tabulation of completion information for those wells within the two-mile area sorted by API number, which isn't a very useful sort.

And then Exhibit 8 is the same data sorted by upper perforation. And if you flip to the third page of the exhibit, that's where you start seeing the upper perforation column is populated. So there are two wells that have perforations in the proposed disposal interval.

The first would be the Pearl #1, operated by Trek Operating. That was a saltwater disposal well with perforations from 3,355 to 4,900 feet.

The second well with perforations in the proposed disposal interval is the Pardue Farms 27-1, operated by Parker & Parsley. It was also a saltwater disposal well. It disposed from 4,394 to 4,462. The next shallowest completion within this two-mile area is

the State JB Com #1, operated by BTA -- oop. Excuse me. It's the Bucka- -- I misread that. It's the Buckaroo #1, operated by Kaiser-Francis, with perforations from 5,626 to 6,045 feet.

And then you can see three are a couple of other wells that have perforations up in that 57- to 5,800-foot range. And as you move down the page, you can see the vast majority of the wells that produce from the Brushy Canyon or actually down around 6,000 feet and deeper.

On page 4, you can see that there are two horizontal wells that have been drilled by Mewbourne. The first is the Yardbirds 3 #1H, and it has perforations from 6,465 to 10,523. That well started producing in November of 2015 and has produced 6,600 of oil in -- I don't know -- four, five, six months of production.

The next horizontal well also drilled by Mewbourne is the Layla 35 1H. That well has perforations from 6,718 to 10,590. That's a good well. It's produced 202,000 barrels of oil. It went on production in December of 2012.

Q. And production with those two Mewbourne wells is substantially below your injection interval?

A. Yes.

Q. We'll go back to page 3 -- well, any of the pages, if you look at the third column from the left, it shows well status. The three wells you identified on page 3 are each shown to be inactive; is that correct? There is no injection through the two injectors at this time?

A. That's correct.

Q. Let's look at Exhibits 9 and 10.

A. Exhibit Number 9 is a cross section that I put together using available well logs. If you flip back to Exhibit 6, which is the map that has the two-mile radius on it, the blue dashed line on the map shows the line of cross section. It roughly goes from northwest to southeast.

On the cross section, I've shown A to A prime, which corresponds to A to A prime on the map. On the cross section, you can see correlation markers for the top of the Bell Canyon, the Cherry Canyon and the Brushy Canyon. So our proposed disposal interval from 2,600 feet to 5,000 feet again includes the Bell Canyon, the Cherry Canyon and the upper portion of the Brushy Canyon.

Q. Can you identify on your cross section the barriers which will serve to keep injection fluids contained within the injection interval?

A. The upper confining interval is going to be above the Bell Canyon, which is a very thick salt in the anhydrite section. You can just see, oh, maybe about 100 feet of it on the upper portion of the cross section.

And I guess the other thing to point out is near the depth track of the wells, you can see where wells produce from the lower portion of the Brushy Canyon just immediately above the top of the Bone Spring. So below marker number five on the cross section, that is where the production is down in the Brushy Canyon. There has to be some sort of a seal there for that oil accumulation to have occurred. We believe that there are other shales below 5,000 feet that will also act to limit the downward movement of the injected fluids.

Q. All right. Would you discuss the permeability, porosity of the injection interval?

A. Well, if you look at the log for the Southwest Royalty Witt #1, there are two logs included on the cross section for all the wells. The left-hand log is going to be an induction resistivity, and then the right-hand log is going to be neutron density porosity log. So if you look at the log, you can see that the porosity in the Delaware section ranges from a high of,

say, 24, 25 percent down to lows of about 15 percent. The porosities are a little bit higher in the shallower portions, and as you go deeper, the porosity is a little bit lower, as you would expect, because of the compaction.

Q. Within your two-mile state area, can you indicate to the Commission where you found Delaware production?

A. Well, from the tabulations and so forth, you can see that the majority of the production from the Delaware is from the Lower Brushy Canyon. There is some -- and this lower portion of the Brushy Canyon is the interval between what I've shown as marker five on the cross section and the top of the Bone Spring.

Q. In proximity to the Gossett location, where does that Delaware production occur?

A. If you're asking me how far away the closest producer is, I'm not sure I can tell you that easily.

Q. Tell us, does the Delaware downdip to the southeast? Is that correct?

A. Regionally, the structure of the Delaware is, as you move to the north, you go updip, and as you move so the south, you go downdip.

Q. And so given that orientation of the structure and the tabulation of wells you show in the producers in

your Exhibits 7 and 8, is it accurate to say that most of the production from the Delaware is situated to the south and east of the Gossett location?

A. Well, no. Actually, in the near vicinity of the Gossett, most of the production is going to be to the north. You can see when you look at the map, there is a higher population of wells up to the northeast. That is going to be updip. There is some sort of a structural feature that has created some sort of a trap to catch oil there. That's why all of those wells are located up in the northeast. As you move to the southwest, you're going to go downdip.

Q. Within the area of your study, how do you assess the productivity of the Brushy Canyon and Cherry Canyon members?

A. I've not identified any production within this two-mile area.

Q. All right. And have you made an assessment of the potential for further Delaware development by horizontal wells?

A. There have been some horizontal wells drilled targeting members of the Cherry Canyon and the Brushy Canyon, and I've identified a couple of the Lower Brushy Canyon producers in the two-mile area.

What I see right now is nobody's

established production in our proposed disposal interval. I know that there was an old well drilled in '54 that swabbed-tested some oil out of some perforations up around 4,800 feet. That was the predecessor to the Bass Production Company, Sid Richardson and Bass, but nobody's ever gone back and tried to commercially produce that.

Q. All right. Based on your examination of the available geologic and engineering data for evidence of open faults or other hydrologic connection between the disposal zone and any underground source of drinking water, are you satisfied that no connection exists?

A. Yes. That thick salt in the anhydrite section that's deposited immediately upon the Bell Canyon is going to act as an excellent upper confining interval.

Q. And if we refer back to the C-108 at page 53, what's marked as Exhibit J there, what does that demonstrate?

A. That is the nearest identifiable quaternary fault, and it's some 53 miles away.

Q. All right. And, again, let's go to pages 45 and 46. And, again, those are all the known water wells within two miles of the Gossett. We've discussed that, correct?

A. Yes.

Q. If you look at pages 47 through 52, what do those show?

A. Well, pages 48, 49, 50 and 51 and 52 are analyses of water from -- water wells in the area, and they show varying qualities of water. Page 48 shows a total dissolved solid of 1,900. Page 49 shows a total dissolved solid of 1,920. Page 50 shows a -- well, that's just a hexane analysis, and it shows 34.

So the purpose of these couple of pages is to show the quality of the ground water in the area.

Q. And it's not good?

A. No, sir.

Q. Mr. Johnston, have you determined the areal extent of the pore space that would be occupied by the injected fluids from the Gossett?

A. Yes. If you inject in -- if you inject into the Gossett well for ten years and your injection interval spans from 2,600 feet to roughly 3,350, limiting disposal to that interval, a plume front calculation shows a radius of roughly 700 feet.

Q. So there is adequate pore volume to accommodate the injection volumes you anticipate through the Gossett?

A. Oh, yes.

Q. Do you foresee any need to come back to the

Division and request a higher injection pressure in the future?

A. Well, that depends on the results. I would expect if we get the permit, the well will be drilled and we'll run a step-rate test on the well to see if we can justify applying for a higher injection pressure than the 520 pounds that we hope to get.

Q. All right. Let's look at Exhibits 11 and 12.

MR. HALL: If I might approach, Mr. Chairman. The copies in your exhibit notebooks didn't reproduce very well, so I have better versions you can share.

Q. (BY MR. HALL) But could you explain what Exhibits 11 and 12 demonstrate?

A. Exhibit Number 11 is a conceptual schematic of how we plan to lay out the truck-unloading facility and the tank battery. All of the traffic areas where trucks will be driven will either be concrete, or they'll be asphalt-covered to try to minimize dust impact on the area.

If you flip to Exhibit Number 12, these are pictures of a facility, I believe in Reeves County, which is representative of the type of facility that High Roller would build if this facility is permitted and we drill the well.

The first picture is a picture of the unloading bay. It's covered. You can see that the ground is concrete, and it's pitched so that any fluids that are spilled during the unloading process go to a sump that runs down the middle of this pitched area. And that sump -- the fluids from that sump are pumped into the tanks.

The second page of the exhibit is another picture of the unloading facility with the adjacent tank battery.

The third page is just another closer picture of the unloading bay.

And then the last page is a picture of the tank battery. The tank battery will have a concrete floor. The tanks will sit on concrete. They'll have concrete walls for containment. And within this concrete containment will be a sump, and any fluids, rain or spillage that occurs, will be pumped from there into a vessel. The capacity of the -- of this concrete vault will be adequate to comply with the spill prevention control countermeasure requirements of the EPA.

Q. All right. So does High Roller plan to construct the Gossett facility similar to what we see in Exhibits 11 and 12?

A. Yes. The reason they do this is the larger companies like EOG, COG, Shell, Anadarko would rather bring their produced water to a facility like this because of the liability issues this is as good a facility as I've seen, this representative facility. And the 36 that they've drilled in the past three years, this is representative of all those other facilities. They spent a lot of money on the surface facilities.

Q. Now, let's refer back to Exhibit 2, which is the original order issued by the Division in this case, and if you could turn to page 6 of that order. And the order in paragraph seven, would you read that into the record, please?

A. "The operator shall take all steps necessary to ensure that the disposed water enters only the permitted disposal interval and is not permitted to escape to other formations or onto the surface."

Q. Is it your opinion that the Gossett injection facility can accomplish that requirement in the original order?

A. Yes.

Q. And that's even with the expanded injection interval?

A. It's with or without the expanded interval, even including the issues that Mewbourne's going to

raise about confinement issues with two of the wells in the half-mile area.

Q. In your opinion, Mr. Johnston, will injection operations pose any threat of impairment to correlative rights or waste of hydrocarbon reserves?

A. It doesn't appear that way to me, no.

Q. And in your opinion, can the project be operated so that the public health and safety and the environment will be protected?

A. Yes.

Q. Were Exhibits 1 through 12 prepared by you or at your direction?

A. Yes.

Q. In your opinion, will granting High Roller's application promote the interest of conservation, result in the prevention of waste and the protection of correlative rights?

A. Yes.

MR. HALL: That concludes my direct of Mr. Johnston. I'd move the admission of Exhibits 1 through 12.

CHAIRPERSON CATANACH: Any objection?

MR. BRUCE: No objection.

MS. MUNDS-DRY: No objection.

CHAIRPERSON CATANACH: Exhibits 1 through

12 are admitted.

(High Roller Wells, LLC Exhibit Numbers 1 through 12 are offered and admitted into evidence.)

CHAIRPERSON CATANACH: Mr. Bruce.

CROSS-EXAMINATION

BY MR. BRUCE:

Q. Mr. Johnston, going back to the 5,000-foot depth, that would include most of the Bell Canyon?

A. All of the Bell Canyon, all of the Cherry Canyon and the upper portion of the Brushy. If you look at Exhibit Number 9, you can see that it will include a little over 300 feet of the upper portion of the Brushy Canyon. That's assuming you agree with my correlation of where the top of the Brushy Canyon is.

Q. And you agree that the Brushy Canyon is productive in this area?

A. Well, like I already said, yes, sir. If you look at the cross section, the lower portion is -- does have established production. That's what the red perforated intervals on Exhibit Number 9 show.

Q. And in the Division's order, finding paragraph 25, the Division found that the Cherry Canyon had viable potential; did they not?

A. You'd have to show it to me. I don't know.

Q. Do you have your Exhibit 2 in front of you? Turn to page 4, finding paragraph 25.

A. It reads: "Opponent's testimony and evidence supported a viable potential for occurrences of hydrocarbon resources in both the Cherry Canyon and Brushy Canyon formations."

Q. And I was unclear on this point. Are you still seeking a maximum of 17,500 barrels of water per day on injection?

A. No, sir. 8,000.

Q. When you're looking at whether a zone is productive or how to determine if it's not productive, what do you look at, you yourself personally?

A. I look at if anybody has been able to establish commercial production within a two-mile area.

Q. Do you look at water saturation?

A. You can look at water saturations. You can look at mud-log shows. But those are fairly subjective. The acid test is has anybody established production and reported production. A mud log shows, in my opinion -- should be given low weight in that sort of analysis. What matters is have you established reportable production to whatever agency you need to report it to.

Q. And if you turn to your Exhibit 3, the C-108, page 9, the fourth well from the left is a Cherry Canyon

producer in this general area; is it not?

A. The Papagayo Federal #1?

Q. The Nel #2.

A. Oh, okay. It's labeled as such.

Q. And you also have a Bell Canyon producer, although this is a distance away, is it not, the Papagayo?

A. It's more than two miles away.

Q. Now, you stated that the maximum pressure under statewide Division rules would be at this point, if this application is approved, 520 psi?

A. That's my understanding. Yes, sir.

Q. And you might, in the future, ask permission to do a step-rate test to do across that pressure; is that correct?

A. I would expect so, yes.

Q. What is the frac gradient in the Delaware?

A. Well, that's the purpose of running the step-rate test, is to determine what's the frac gradient for the rock at the location of that disposal well.

Q. You talk about the areal extent of the injection. I think you said a 700-foot radius; is that correct?

A. Yes, sir. If you assume 490 feet of sand, 22 percent porosity, 8,000 barrels a day, 365 days a year

for ten years, it comes out to be like a 695-foot radius.

Q. Do you expect this life -- this well to only have a ten-year life?

A. You know, I don't know. But if the permit allows them to put 8,000 barrels a day away, with that pressure limitation, the 520, I doubt that they'll be able to put 8,000 barrels a day away consistently.

Q. And this well is located 313 feet -- or it will be located 313 feet away from the south line of Section 33, correct?

A. Yes.

Q. So 700 feet exceeds, obviously, 313 feet?

A. Yes.

Q. Looking at your Exhibit 9, you're going down to 5,000 feet. Where is your impermeable barrier -- fluid movement?

A. It would be the zones that have higher resistivity and lower porosity. Again, I believe that the Southwest Royalty Witt #1, which is very near to the Gossett, is pretty representative of what we expect to encounter, and you can see that there are some lower porosity intervals just below 5,000 feet.

Q. But if you're looking at the Witt #1, that's not until you get to about 5,900 feet; is that correct?

A. Well, there are some higher resistivity intervals just immediately above 5,000 feet, and then there are some others a little bit deeper.

Q. But you're requesting permission to inject down to 5,000 feet?

A. Yes. But we're not going to perforate anything that doesn't have good porosity development and we have signs of invasion on the resistivity curve.

Q. But you won't know that until you drill?

A. That is correct.

Q. And also when you mentioned the Witt #1, if you look at the well to the right of that, the Trek Operating, the barriers you talk about in the Witt well are nonexistent in the Trek Operating well, are they?

A. Some of them are. Down around a depth of about 5,200 feet, there are some higher gamma-ray intervals that have corresponding high resistivity and lower porosity values.

Q. Looking at the Witt well again, right down at 5,000 feet, if you're looking at the log, the vertical line, second over, is the porosity, correct?

A. I'm sorry. Would you say that again?

Q. Is the zero porosity line. If you're looking at the log for the Witt well --

A. Okay.

Q. -- starting at the right-hand side of that log, you move over to the first vertical line on this plot, that's the zero porosity line; is it not?

A. Yes. Well, let me say it this way. The scale on the porosity curve is minus 10 on the right to 30 percent over by the depth track.

Q. But --

A. So the first solid line is zero. The next solid line is ten, and then the next solid line is 20.

Q. And you never get over to the zero percent porosity line? There is no porosity at the depth of 5,000 feet?

A. Well, you're never going to go to complete zero porosity, but I wouldn't expect much fluid movement when you get down below 10 percent porosity. When I designed these completions, I looked for intervals that have greater than 15 percent porosity.

Q. A few final questions, Mr. Johnston, and if you don't know, then you don't know. But does High Roller own any mineral interests in the southeast quarter-southeast quarter of Section 33?

A. I don't believe they do.

Q. Has High Roller look at drilling a Devonian SWD well rather than a Delaware SWD well?

A. We have looked at the Devonian, and we don't

believe that it has very good potential for disposal.

Q. Have you looked at differences in AFE for drilling a Devonian SWD well versus a Delaware SWD well?

A. Well, drilling to the Devonian is going to be substantially more expensive. We're talking about having to drill an extra 10,000 feet, roughly.

MR. BRUCE: I think that's all I have, Mr. Chair.

CHAIRPERSON CATANACH: Ms. Munds-Dry, do you have any questions?

MS. MUNDS-DRY: No questions, Mr. Chairman. Thank you.

CROSS-EXAMINATION

BY CHAIRPERSON CATANACH:

Q. Mr. Johnston, you said the well will be operated by a different company than the company that drills the well? It's not going to be High Roller that operates, right?

A. Initially High Roller will take it operational, and then we'll seek to transfer operatorship to a company by the name of NGL Water Solutions, which is a publicly traded company based in Denver, Colorado.

Q. Can you tell me what the association is between your company and NGL Water Solutions?

A. NGL and High Roller have a development contract

agreement wherein High Roller will drill, complete, build the facilities, and once they go operational, then they will sell the facility to NGL.

Q. So you won't retain an interest in the well?

A. No.

Q. It wasn't brought up, but in the initial hearing, I think there were some issues with regards to the surface at this proposed location. Can you tell me what that -- where this facility will be as far as -- is it in a town? Is it in a residential area?

A. As I understand it, the piece of property adjacent to this, a family has built a residence on it. As far as how many residences are in the area, I can't tell you. I do know that one of the individuals that appeared at the first hearing indicated that they were in the process of building a house on the adjacent piece of property. And as I understand it, it's actually -- if you flip to Exhibit Number 11, as I understand it, that residence is being built just to the south of this proposed facility diagram. And we are amenable, or will, if that house has actually been built, move the tank battery and the facility as far away from that residence as we can.

MR. HALL: Mr. Chairman, if you can turn to page 14 of the C-108, there is an area locator there.

Q. (BY CHAIRPERSON CATANACH) So the town of Loving would be to the north then?

MR. HALL: Yes.

Q. (BY CHAIRPERSON CATANACH) So with regard to the injection interval, you believe you need the additional -- additional interval that was not approved by the original order to get enough water into this well?

A. No. Let's see. If we flip to --

Q. Because the original order approved 2,600 to 3,200. So you're seeking to go down to 5,000 again?

A. Yes, sir.

If you look at page 37 of the C-108, that is a wellbore schematic for the HNG Oil Pardue Farms #1. You can see that that well has a cement plug from 3,573 to 3,673. As I understand it, the thrust of Mewbourne's protest at this point is going to be that this well will allow for the movement of injected fluids out of the injection interval.

And then if you flip to the next page, page 38, that's an HNG Vasquez 4 Com #1. That well had 7-inch casing cut and pulled. Top of the cement plug's at 4,946.

Again, Mewbourne's -- the thrust of their protest today, which is different than the original

hearing, is they're going to say we have a confinement issue.

So one way to -- the best way, in my opinion, to address the confinement issue is to drop the bottom of the disposal interval deep enough so that both of these two wells have adequate cement plugs so we don't have the movement of fluid out of the permitted interval.

Perhaps one way to thread the needle on this would be to grant the disposal interval from 2,600 feet to 5,000 feet but put a provision in there that we can't perforate any deeper than 3,350.

Q. Well, if you're permitted from, 2600 to 5,000 feet, that whole -- that whole injection interval is open in the Vasquez 4 Com #1; is that correct?

A. Yes, sir.

Q. So what good would it do to confine the injection to 3,300 to 5,000 feet? You're still going to have that interval open.

A. Yes, sir. The other option is to grant the permit with an interval from 2,600 to 3,350 and then put a provision in there that we have to re-enter and spot adequate cement plugs to obtain confinement in these two wells.

Q. And is that something that your company's

willing to do?

A. They certainly would look at it. It's an added cost, but building this facility, they're talking about spending quite a bit of money anyway. They consider this to be a good location because of all of the Bone Spring and Wolfcamp development that's going on in the area. There is a need for disposal capacity in the area.

Q. Okay. So wouldn't that same -- wouldn't that hold true for the Pardue Farms #1 well as well? That -- that appears to be open in the injection interval also. That's the lower -- the upper plug would be 2,442, and it would be open from 2,442 to 3,573. So that would be the same situation, correct?

A. The two confinement-issue wells would be Pardue Farms #1 and the Vasquez 4 Com #1. Yes, sir.

Q. So if your application was granted, I mean, it may be that you would have to do -- re-enter both of these wells --

A. Yes.

Q. -- to solve the confinement issue?

A. Depending on what disposal interval is approved, that is correct.

Q. Well, you're asking for 2,600 to 5,000 feet.

A. If the permit's issued that way, then there is

no confinement issue. In the Pardue Farms, the upper -- or the bottom plug that spans from 4,485 to 4,585, along with the cement on the side of the 7-inch, would confine the lower movement of fluid.

Q. But if you perforate it at 2,600 feet, you would still have a confinement issue there. I mean, it would still allow that to go into the formation and possibly migrate from there?

A. Well, no. I don't believe that that would be a problem because that shallower interval that you're referring to is going to be the salt in the anhydrite section which will not take fluid. It doesn't have permeability.

Q. Where would the top of the Bell Canyon be in that well?

A. I'd have to look at the log. Again, that --

Q. Okay. I had a question on the Witt #1. I had a chance to review this application before the hearing, and that -- apparently the well file shows that that cement was circulated on that 5-and-a-half-inch casing.

A. I'd have to pull the paperwork, but I calculated that the top of the cement was at the surface on Exhibit Number 5.

Q. So you did recalculate that?

A. I'd have to look at my notes. I don't remember

if I took the top of surface as being ground level or if the paperwork reflected that.

Q. Okay. I would like to see that calculation because I calculated the cement top of about 2,400 feet in that well. So I'm a little concerned about the -- that you are portraying that to be a surface. I don't know. That could be a possible issue with regards to migration of fluid into the salt section, so if you could provide those calculations to me.

A. Okay. Do you want to take a five-minute break and let me see if I can find it?

Q. Yeah. After we finish the cross, we can take a five-minute break.

A. Okay.

Q. So OCD originally didn't allow injection into the Bell Canyon. You disagree with that, that it's potentially productive?

A. I see no evidence that the Bell Canyon's productive in this area. There are other areas in the Delaware Basin where you do have features -- structural features where the members of the Bell Canyon are productive, but there are none within two miles of this location.

Q. And you believe that also to be true of the Cherry Canyon?

A. Yes, sir, no established production.

Q. Do you have an opinion as to whether those zones might be productive in a horizontal completion?

A. If you're not able to establish production with a vertical well in this sort of a reservoir where you've got good porosity development and decent permeability, if you're not able to make -- if you're not able to establish production with a vertical well, I would doubt that you're going to be able to establish commercial production with a horizontal well.

The problem that you -- that I envision is most of the oil accumulation that you have in the Delaware, in particular sands, is when you have some sort of a structural feature where you trap some oil as it's migrating shallower. So you've got a thin oil column on top of a large wet sand. Your ability to land the well up in that oil column and keep it up there, you know, while the well is porpoising as you directionally drill it, that's tough. It's hard to do.

Q. Mr. Johnston, do you believe that injection into this interval will cause any drilling problems for wells that are drilled deeper in this area for any producing wells?

A. It depends how close they are drilled to the -- to the disposal well. If you drill very close to a

disposal well, certainly you're going to have to drill with a heavier mud weight to control the increased pressure, but if you get some distance away from the disposal well, that pressure increase with the injection separation is causing dissipating the further you get away from it.

Q. We've had some discussions with some operators in southeast New Mexico regarding Delaware injection. It is a big issue with us right now. And I don't know if this is one of the areas in particular, but we've been informed that some of these areas are getting to be really high pressure, some of these injection intervals that are being used. To your knowledge, that's not -- is that in this area; do you know?

A. I don't know. I would not expect that it's a problem in this area because there hasn't been very much injection.

COMMISSIONER PADILLA: I just have a few.

CROSS-EXAMINATION

BY COMMISSIONER PADILLA:

Q. Good morning, Mr. Johnston.

Just to clarify, on Exhibit Number 1 -- I think we've established this. But for the proposed hearing on May 19th, 2016 does not reflect what you're actually proposing with the 34- -- 3,340 as a depth?

We've amended that to 5,000?

A. Yes, sir.

Q. Okay. Does that affect anything else in the rest of the exhibits as it correlates to -- to what the Applicant is requesting?

A. Well, the C-108 was originally filed and continues to take the -- show drilling to 5,100 feet, so I believe that is consistent with this expanded interval.

Q. Okay. Going to your testimony about a plume after ten years of operation at max rates, what are those depths for the calculations? Are you talking 3,400 feet, or are you talking 5,000 feet in that 700-foot radius calculation?

A. That would be looking at what good sands exist between 2,600 and 3,350.

Q. Okay. So theoretically it could be smaller if you were going all the way to 5,000?

A. Absolutely. It would be much smaller.

Q. Okay. And it was touched on briefly earlier, but the ownership -- I know you're not here to testify about ownership, but I'm assuming this is fee surface?

A. They own the surface at the proposed location. They purchased it.

Q. Okay. And you don't have any idea about the

mineral interest in any --

A. I'm not -- I don't know.

Q. -- in the immediate area?

Okay. And just to clarify, 4-and-a-half-inch N80 polylined injection stream would be --

A. The tubing stream would be four and a half, yes, sir. The reason they do that is to minimize friction.

Q. And corrosion, presumably?

A. They run that 4-and-a-half inch -- really it's a 4-and-a-half-inch casing, is what they're running for tubing.

Q. N80 is pretty heavy?

A. Yeah. It's -- I believe it's the 1126 pounds, is what the plan is to run.

Q. Okay. That's all I have.

CHAIRPERSON CATANACH: Commissioner?

COMMISSIONER BALCH: Sure.

CROSS-EXAMINATION

BY COMMISSIONER BALCH:

Q. Good morning, Mr. Johnston.

A. Good morning.

Q. I want to follow up a little bit on Commissioner Padilla's question about the radius and the

expected saltwater plume. How many feet of perforations did you use in that calculation, approximately?

A. 490.

Q. Out of the original -- you had 2,600 to 3,335 feet, something like that?

A. Roughly, 3,550.

Q. 3,550.

A. So if you included the entire interval, you would add up a lot of sand thickness to that, which would shrink that roughly 700-foot radius.

Q. Right.

You talked a lot about porosity. You didn't talk about permeability -- expected permeability.

A. I would -- in my experience, the Delaware, with this sort of porosity, it's a sandstone. It's going to have not great permeability. It's not going to be hundreds of millidarcies, but I expect it to be in the range of 75 to 125 millidarcies, something like that.

Q. Of course, you need a step-rate test to get the actual parting pressure of the rock, but what do you calculate that -- depth to be in your injection interval? What do you expect to see?

A. I would expect the frac gradient for this rock to be somewhere in the, say, .62 to .72 range.

High Roller Wells just drilled and

completed a well a mile or two south of the state line, about 15 miles south of here (indicating), and when they did the pump-in test, which was a step-rate test, we saw gradients up on the order of .66 psi per foot. And we did not see any break-over. We were not fracing the well in that analysis.

Q. I think that is Exhibit 7?

A. Yes, sir. Or 6.

Q. 6. Okay.

On your listing of wells in Exhibit 8, there are a number of inactive wells that had no perforations in them. I'm just curious about the status of six of those wells in particular. The two nearby saltwater disposal wells, Pearl #1 and the Pardue Farms #1, those are inactive saltwater disposal wells, and they were perfed -- Pearl #1 at 355 feet and Pardue Farms at 4,394 feet --

A. Yes, sir.

Q. -- upper perforations?

The Pearl #1 was actually nearly within the half-mile radius of your well; is that correct? Just outside of the half-mile radius, on page 3 of Exhibit 8?

A. Yes, sir. Yes, sir. It's -- looks to be 1,000 feet due east of the -- of the half-mile circle.

Q. Right.

So these are inactive saltwater disposal wells that are in approximately the same interval and nearby. Do you know anything about the status of those wells?

A. Just that they're not active, and I don't know why they went inactive or if they've been plugged.

Q. Do you know approximate injection volumes that may have gone into those wells or periods of operation? I guess you wouldn't know the periods of operation.

A. No. I don't know the periods of operation.

If you flip to page 8 of the C-108, we indicated that at least a million barrels of water had been injected into that API number, 40496, which is the Pearl well you're talking about, for the last two years.

Q. In the last two years, it's taken a million barrels?

A. I'd have to refer to -- I'd need to ask somebody something, but it's taken a million barrels. I don't know specifically what the time frame was when it did that.

MR. HALL: Dr. Balch, we do have another individual available who could provide some testimony about completion information on those wells' production.

COMMISSIONER BALCH: On the saltwater disposal wells?

MR. HALL: Yes, sir.

COMMISSIONER BALCH: Okay. Perhaps you might want to follow up on that.

Q. (BY COMMISSIONER BALCH) How about the four inactive Brushy Canyon wells that are within the two-mile circle? They're also unperforated. I'm not sure what inactive means in that case. Drilled and never completed? They're not plugged and abandoned.

A. I'd have to check the available records to answer that. I don't know.

Q. In your table in Exhibit 8, I mean, there are a lot of inactive that show perforations. What does that generally mean?

A. What I did in table number eight was I went through and any wells that had perforations in the -- any of the Delaware sands, I went and tried to populate the perforated intervals. The vast majority of the wells that don't have recorded perforations are for Atoka, Bone Spring, deeper horizons.

Q. Right. But I did pick out four Brushy Canyon wells.

A. Did I miss a couple?

Q. Well, there are four Brushy Canyon wells or at least four wells that targeted that reservoir, Brushy Canyon East, in all four cases. They're on page 3 --

I'm sorry -- page 2 of Exhibit 8, Layla 35, Softail BC 26, Yardbirds 34 PA, Speedwagon 001H 27.

A. Yeah. I see the wells you're talking about.

Q. Would your other experts also be able to address those inactive wells?

MR. WOOD: No.

COMMISSIONER BALCH: Just the saltwater wells?

Q. (BY COMMISSIONER BALCH) So you don't know what the status of this well is?

A. Well, just that the filings -- the database that I accessed showed them as inactive. It was an oversight on my part not to populate what the perforations are for those four wells.

Q. Oh. So there may be actually be perforated intervals for those?

A. I would expect -- well, if you look at them, the top one, the Layla 35 #3H, it has -- you see that it has zero reported production.

Q. Right.

A. Okay. The next one is the Softail 1H. It's another horizontal well. Again --

Q. Zero production.

A. -- zero production.

The next one is the Yardbirds 34 #2H.

Again, no production.

And then the next is -- it doesn't have a fee name, but it shows it's a horizontal well and, again, zero production. So I would expect what's happened is the filing of the drilling permit has caused these wells to go into the database, but since they're not completed, that's why there is no -- or might not have been drilled.

Q. New wells or planned wells?

A. Only drilling permits. The fact that there is zero production in the column dated -- "FP Date" and "LP Date," that's first production date, last production date. Means to me it's a drilling permit that may or may not been drilled.

Q. How long do those things stay in the record? Is that forever?

CHAIRPERSON CATANACH: Yeah. I think they do.

THE WITNESS: In this database, I'm afraid they're going to stay there forever.

COMMISSIONER PADILLA: When the API expires.

COMMISSIONER BALCH: Which is five years?

COMMISSIONER PADILLA: No. It's two years.

THE WITNESS: Two years.

COMMISSIONER PADILLA: I'll ask you one more question quickly.

RECROSS EXAMINATION

BY COMMISSIONER PADILLA:

Q. I'm curious about the transfer of the facility post-construction. Is that typical of the business model used in Texas as well, or is it something specific to New Mexico?

A. That is the business model that's been used in Texas for the, roughly, 36 wells that I've mentioned.

Q. Build them, get them going, sell them?

A. Yes.

Q. So you don't retain any operations?

A. No.

And NGL, at the same time, they operate nearly 50 disposal wells in Texas and a number of them in Colorado, North Dakota.

Q. Okay. Thank you.

RECROSS EXAMINATION

BY CHAIRPERSON CATANACH:

Q. So just for the record, if you inject 8,000 barrels a day for ten years, that's 29 million barrels, approximately. Just for reference, I mean, you know, that one well injected a million barrels, but you're talking about 29 million barrels over a period of time?

A. It would be a very large number. Yes, sir.
Q. Okay.
CHAIRPERSON CATANACH: Can we call the next witness?
MR. HALL: Did we have you sworn?
MR. WOOD: Not yet.
MR. HALL: Mr. Chair, ask this witness be sworn.
MR. BRANCARD: Mr. Chair, I'd like to clarify one thing.
CHAIRPERSON CATANACH: Sorry, Mr. Brancard.

CROSS-EXAMINATION

BY MR. BRANCARD:
Q. I just wanted to clarify what High Roller Wells' position is in this case. High Roller Wells did not file for a de novo hearing?
MR. HALL: That's correct.
Q. (BY MR. BRANCARD) Okay. But now you are taking us back to your original C-108 application as the basis --
A. Yes.
Q. -- for this --
A. Yes, sir.
Q. -- for the interval but with a change to the injection rate?

A. Yes. We're reducing it. Yes.
Q. Okay. Could you look at Exhibit 2, the Division order? I just want to clarify for the sake of the Commission and to try and develop a decision here. If you look at sort of page 5 on, there is the Division's orders. Obviously, you disagree with number two at this point. But is there anything else here that the Division has ordered as stipulations to approval that you disagree with? A lot of these are sort of standard conditions the Division puts into these orders.
A. I believe that those provisions, 1 through 19, are all things that we can live with.
Q. Okay. Thank you.
CHAIRPERSON CATANACH: Thank you, Mr. Brancard.
Let's swear in your additional witness.

BRIAN WOOD,

after having been first duly sworn under oath, was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. HALL:
Q. For the record, state your name, please.
A. Brian Wood, Santa Fe, New Mexico.
Q. Mr. Woods, by whom are you employed?
A. Permits West.

Q. And tell us briefly what Permits West does.

A. We help companies acquire permits to use land, principally oil and gas type uses, but we work on pumice lines, radial [phonetic] lines, powerlines, communication.

Q. Did you participate in the completion of the C-108 for the Gossett?

A. Yes.

Q. Are you familiar with the well files for the Pearl #1 and Pardue Farms #1 disposal wells?

A. The Pearl 1, in particular, when I prepared the C-108, I looked at the GO-TECH database, derived, you know, the injection volumes from that. So, in essence, that's why I use the phrase at least 1,085,000 barrels have been disposed of at that point. The application was filed in December of 2014 so that probably would have been up through September or October of 2014.

We had a question yesterday about why was it inactive. I looked at the OCD Web site last night. There was a sundry -- a series of sundry notices filed last year, I believe late summer or early fall, indicating they had a packer leak. They subsequently went in and repaired the packer leak.

CROSS-EXAMINATION

BY COMMISSIONER BALCH:

Q. So that's an active saltwater disposal well?

A. Yes. I don't know that they're injecting today, but, like I say, my hunch is that that's why the report was inactive, was because of the packer leak. But they have shut the well in. Obviously, they have since repaired it. And I did not check to see if it's been injecting since the repair.

Q. Do you know what rate they're injecting at?

A. I do not.

Q. The Pardue Farms #1, that's quite a distance away, maybe two miles. Do you know anything about that well?

A. I do not.

CHAIRPERSON CATANACH: No other questions? Any questions of this witness?

Okay. This witness may be excused.

Let's go ahead and take a break here before we proceed.

(Recess 10:43 a.m. to 10:55 a.m.)

CHAIRPERSON CATANACH: Call the hearing back to order.

And let's see. You're going to answer the question I had?

RICK JOHNSTON,

after having been previously sworn under oath, was recalled, was questioned and testified as follows:

THE WITNESS: Yes, sir. On the Witt #1, all that I have is a Form C-105, and it shows that a 5-and-a-half-inch casing was set at 6,299 in a 7-and-7-eighths-inch hole, cemented with 740 sacks of premium-plus cement, using a -- I'm not sure I know what premium plus in that is, but assuming a yield of about 1.1, I get 814 cubic feet of cement and a factor of .1733 cubic foot per foot. Come up with a cement height of 4,697. If you subtract that off of 6,299, that shows a top of cement at 1,602.

Q. (BY CHAIRPERSON CATANACH) Okay. We'll take another look at that, see if there is anything else in the well file, see if we can find it. Okay?

CHAIRPERSON CATANACH: This witness may be excused?

MR. HALL: Yes, sir. We'll reserve the right to call him to provide rebuttal testimony.

CHAIRPERSON CATANACH: Okay.

CLAYTON PEARSON,

after having been previously sworn under oath, was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Would you please state your name and city of residence?

A. Clayton Pearson, Midland, Texas.

Q. Who do you work for and in what capacity?

A. I work for Mewbourne Oil Company as a petroleum landman.

Q. Have you previously testified before the three-member Commission?

A. No.

Q. Have you testified in front of the Division?

A. Yes, I have.

Q. And were your credentials as an expert petroleum landman accepted as a matter of record?

A. They were.

Q. Could you just briefly summarize your educational and employment background?

A. I received an undergraduate degree from Texas Tech University in May of 2011. I received an energy commerce degree. And I have worked as a petroleum landman since July of 2011 full-time.

Q. And who have you worked for?

A. I've worked as an independent contractor for approximately six months, and then I started working for

Mewbourne Oil Company in November of 2011.

Q. And are you familiar with the land matters involved in this application?

A. Yes.

MR. BRUCE: Mr. Chairman, I'd tender Mr. Pearson as an expert petroleum landman.

MR. HALL: And we do not object.

CHAIRPERSON CATANACH: Okay. Mr. Pearson is so qualified.

Q. (BY MR. BRUCE) Mr. Pearson, would you identify Exhibit 1 and just briefly discuss its content?

A. Sure. Exhibit 1 is a plat showing the general area. It shows Mewbourne Oil Company's leasehold position. Any tract highlighted in yellow is a working interest unit that we have created and operate or plan to create and operate. It also shows some drilled wells that we operate, as well as some staked or permitted wells.

Any of the solid brown lines represent a drilled well. Any of the dashed brown lines represent a stacked or permitted location.

It also shows the general location of a Devonian SWD well that we have recently drilled and completed in Section 27 of Township 23 South, Range 28 East.

Q. Okay. Now, you talked about -- Mewbourne does have an ongoing development program in this area; is that correct?

A. We do. We're targeting horizontal wells in the Delaware Formation, Bone Spring Formation and Wolfcamp Formation.

Q. What are Exhibits 2 and 3?

A. Exhibits 2 and 3 are just a portion of a couple of leases we have on this acreage that are being reviewed today. They're fully executed and recorded in Eddy County, New Mexico.

Q. Okay. So you do own a leasehold interest in the quarter-quarter section containing the proposed SWD well?

A. That is correct.

Q. Is it a partial working interest?

A. Yes. We own 50 percent. The other 50 percent working interest is owned by COG Production, LLC.

Q. And will Mewbourne's engineer and geologist discuss the technical reasons why Mewbourne opposes this application?

A. Yes, sir.

Q. Were Exhibits 1, 2 and 3 prepared by you or under your supervision?

A. Yes.

MR. BRUCE: Mr. Examiner [sic], I'd move the admission of Exhibits 1, 2 and 3.

MR. HALL: No objection.

MS. MUNDS-DRY: No objection.

CHAIRPERSON CATANACH: Exhibits 1, 2 and 3 are admitted.

(Mewbourne Oil Company Exhibit Numbers 1, 2 and 3 are offered and admitted into evidence.)

MR. HALL: No questions of this witness.

CHAIRPERSON CATANACH: Mr. Pearson, just one question.

CROSS-EXAMINATION

BY CHAIRPERSON CATANACH:

Q. I don't see any proposed wells in Section 33 or to the south of Section 4.

A. These proposed wells and drilled wells only represent in the Delaware Formation. We do actually have two wells. We have drilled one. It's reached TD. And we created a 960-acre working interest unit, which is composed of the south half of Section 33 and Section 4 just to the south of it, and we are currently drilling a second Wolfcamp well in the east half of that working interest unit as we speak.

Q. And those are -- that's a Wolfcamp well?

A. That's correct.
Q. You don't have any Delaware wells planned for drilling in these two sections?
A. At this point in time, we don't have any staked or permitted, but I believe it is a target in this area.
Q. Does Mewbourne operate these wells?
A. Yes. We are the operator.
COMMISSIONER PADILLA: Just one quick one.

CROSS-EXAMINATION

BY COMMISSIONER PADILLA:
Q. For the sake of clarification, with the Gossett label there, I can't really see the south half of 33, but I'm assuming that is all Mewbourne leasehold.
A. It is not all Mewbourne leasehold, but it is under a Joint Operating Agreement of which we are the operator.
Q. But the southeast quarter is part of that where the label kind of sits on top?
A. Correct. We do have leasehold there, and it's under -- we have a contractual interest under the JOA.
Q. Okay.
COMMISSIONER BALCH: I have no questions.

NATE CLESS,

after having been previously sworn under oath, was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Would you please state your name for the record?

A. Nate Cless.

Q. And where do you reside?

A. I live in Midland, Texas.

Q. Who do you work for and in what capacity?

A. I'm a geologist for Mewbourne Oil Company.

Q. Have you previously testified before the full Commission?

A. No, I have not.

Q. Have you previously testified before the Division?

A. I have.

Q. And were your credentials as an expert petroleum geologist accepted as a matter of record?

A. Yes, they were.

Q. Can you please summarize your educational and employment background for the Commissioners?

A. Yeah. I received -- in 2007, I received my bachelor of science degree from Kansas State University in geology. I then began working for Mewbourne Oil Company in January 2008. I also received my master of science in geology from the University of Oklahoma in

2009, and since then I've been working full-time as a geologist for Mewbourne Oil Company.

Q. Does your area of responsibility at Mewbourne include this portion of southeast New Mexico?

A. Yes, it does.

Q. And are you familiar with the geology involved in these -- in this case?

A. Yes, I am.

MR. BRUCE: Mr. Chairman, I'd tender Mr. Cless as an expert petroleum geologist.

MR. HALL: No objection.

CHAIRPERSON CATANACH: Mr. Cless is so qualified.

Q. (BY MR. BRUCE) Mr. Cless, could you identify Exhibit 4 for the Examiner [sic] and discuss why, in summary, Mewbourne objects to the granting of this application?

A. In Exhibit 4, there are just a few bullet points on why we object to High Roller's case. In the initial hearing, we presented evidence that the Cherry Canyon and the Brushy Canyon both have -- both are productive within this two-mile area. We have -- which I'll show you on some of these subsequent pieces of evidence that we have actual production -- commercial production coming out of both the Brushy Canyon and

Cherry Canyon.

We also believe that there is viable potential in the Bell Canyon. We didn't get into too much detail on the Bell Canyon at the first hearing, but we'll get into more detail today about it.

The Division concluded that our testimony supported that there is viable potential for occurrences of hydrocarbon resources in both the Cherry Canyon and the Brushy Canyon, after the initial hearing. And then we just believe that High Roller will not be able to keep their injection water contained to just the Bell Canyon, Cherry Canyon, or now the Brushy Canyon, which they're asking for. We don't believe they'll be able to contain their -- the injected water.

Q. Why don't we move on to your Exhibit 5? Identify that. It contains a lot of data. Let's roll through that exhibit.

A. So Exhibit 5 is a little larger regional map which I've gone through and I've highlighted all of the -- all of the wells that produce out of the Delaware Formation. So I've broken it up into four different zones, the Bell Canyon, which is the uppermost part, the Cherry Canyon. And I've broken it into the Upper Brushy Canyon and the Lower Brushy Canyon. And these are all color-coated with these production circles.

The Bell Canyon is blue color. So you can see kind of up to the north, in the 22-28 of the little Bell Canyon field up there. And then about three or four miles to the southeast of the proposed Gossett, there is another Bell Canyon field over there through that.

The Cherry Canyon producers are highlighted with red production circles. And so the main well that we're keying off of is going to be in Section 2 of 24-28. It's a Cherry Canyon well. That produced 15,000 barrels of oil back in the '50s out of the Cherry Canyon.

And then you can see the main field in this area is, as Mr. Johnston said, the Lower Brushy Canyon. It's highlighted with the light green circles. But then there is also Upper Brushy Canyon production in this area, and those are highlighted with the dark green circles.

On here I've highlighted all horizontal Delaware activity, so the solid brown lines represent a horizontal Delaware well that has been drilled. The dashed lines -- the dashed brown lines represent wells that we have either staked or permitted for the Delaware Formation.

You can see just in this immediate area, we

have drilled the Delaware well in the west half-west half of Section 35. We have also drilled another Delaware well less than a mile away from the proposed Gossett SWD in the west half-east half of Section 3. That well we recently drilled about six months ago. Both of those are productive -- good productive, economic horizontal Delaware wells, and those are both -- we targeted the Lower Brushy Canyon in this area.

If you just kind of look more regionally, there is a lot of Delaware horizontal activity that's taking place. And if you go -- if you look on the bottom part of the map, the south half of 24-28, there is a little field of Upper Brushy Canyon horizontals which has been drilled there, again the dark green circles. A lot of those are half-mile laterals. But that's a good productive, economic field

In the bottom right part of the map, there is a Lower Cherry Canyon horizontal field that has been drilled, again a lot of those little half-mile laterals. And those were some of the first horizontals that were drilled in the Delaware out here in New Mexico. And then there are just a lot of other Lower Brushy Canyon horizontals drilled off to the east.

So the Delaware is a very productive

formation in this area, and it's also an active area for a lot of the operators, in addition to Mewbourne Oil, for current horizontal development.

Q. In looking at this plat, for instance, the well you mentioned in Section 2 of 24-28, that was a Cherry Canyon producer?

A. Yes. It was a Cherry Canyon producer.

And looking through Mr. Johnston's exhibits, there's -- whenever you -- whenever you get data in New Mexico, a lot of the data companies that provide -- that provide us all this data, they'll -- they'll -- they'll look at what was first completed.

So, for example, if a well was first completed in the Lower Brushy Canyon Formation and then was subsequently -- subsequently recompleted up into another part of the Delaware Formation, like the Cherry Canyon, in New Mexico, all you have to do is file a sundry report. Well, those data -- those data service companies don't catch those sundry reports, and so a lot of times that can be missed by companies who aren't -- who just kind of briefly scan through this area.

But on my -- on a later exhibit, I've got the sundry report that was filed, as well as an authorization to transport that was filed showing that that well did indeed produce out of the Cherry Canyon

Formation and not the -- not the Lower Brushy Canyon Formation.

Q. But overall looking at it, there are obviously Bell Canyon pools nearby?

A. Yes. There are certainly -- yeah. Like I said, the closest one is just to the southeast. That is the Malaga Delaware field, and it's made 1.3 million barrels of oil and 3.9 million barrels of water.

Q. And those are all vertical wells?

A. Those are vertical wells drilled back in -- I believe it was back in 1952, when that vertical [sic] field first came online.

We have also -- it's just off of this map. We're just over in 24-27, Section 11. We operate a Bell Canyon well. And it's just an isolated Bell Canyon well that sits out there by itself, but it's -- you know, it's still a productive, economic well.

So we -- I mean, we've seen -- I guess the Bell Canyon right now it's not something that people are going out and drilling just because there are so many other deeper objectives right now, the Wolfcamp and the Bone Spring and these Lower Brushy Canyon wells, but -- but it's certainly something that somewhere down the road, you know, people are going to keep trying and going back.

And we've got mud-log shows through this area, which have shows -- which have shows through the Bell Canyon, which I'll show you on my next exhibit. And also just looking at log analysis on some of this stuff, I mean, water saturation calculations, and you can see the resistivities in some of the Bell Canyon sands, which would indicate they would calculate as a productive sand. So --

Q. And is it -- there are a number of Wolfcamp and Bone Spring wells in this area either drilled or being drilled?

A. Yes, that's correct.

So we've drilled over in Section 35. They're not highlighted, but you can see there are a lot of horizontal laterals that are in Section 35. We've drilled three 2nd Bone Spring sand wells in Section 35, as well as two Wolfcamp wells in Section 35. In Section 33 and Section 4, we've drilled two mile-and-a-half Wolfcamp laterals.

And the reason we're drilling Wolfcamp first is because we're holding -- a lot of our leases have expirations. So we're going in and we're holding these acres -- this acreage and coming back and developing it after our -- after our leases have held. But yeah, there is -- there is quite a bit of -- of

other activity in this area.

And one thing I'd like to point out is a lot of our Bone Spring wells that we've drilled in Section 35, there was no -- there was no vertical Bone Spring well that we were offsetting that told us, Hey, this is a productive zone. You know, we were able to do -- we've kind of extrapolated from other areas. You know, we've gone out and said, Hey, that looks productive. And we've gone out and tested it, and sure enough, it's been productive horizontally.

Q. Those are commercial wells?

A. That's right. We don't necessarily need vertical wells directly offsetting our acreage to tell us that it's economic or not or that it's productive or not.

Q. So it was the advent of horizontal drilling that made the Bone Spring productive in Section 35?

A. That's correct.

Q. And it's the advent of horizontal drilling that is making the Wolfcamp economic in this area?

A. That's correct.

Q. And, again, you believe that there is potential in the Brushy Canyon, not only the Lower Brushy Canyon but the Upper Brushy Canyon?

A. Yes. That is correct.

And -- and, again, you can look at these other horizontal fields which -- which are in the area which show people have tried -- tried the Upper Brushy Canyon and the Cherry Canyon. And you can also just see it's a lot of vertical wells. You know, the Lower Brushy Canyon is obviously the main -- the main vertical player in this area, but there's a lot of -- just to the -- just to the south and east of here, there are three Cherry Canyon horizontals -- not horizontals -- three Cherry Canyon vertical wells within four or five miles of this area, and they're just kind of scattered, isolated throughout here. But we do believe that there is potential.

And I've also put a structure map -- or a structure layer on this map, and this is my structure map on the top of the Bone Spring Formation. And so kind of like what Mr. Johnson [sic] was saying, we believe that there is a little structural feature, a structural component that sets up this Delaware field. But we don't believe that it just sets up the basal Brushy Canyon. We believe that it also extends up into these other Delaware sands, so there is going to be potential all along this structural feature.

Q. Let's move on to your cross section marked as Exhibit 6. Can you discuss that for the Commission?

A. Yeah. So Exhibit 6 is a little bit of a large exhibit but feel free to stop me at any point in time if you have questions.

So this is a -- this is a north-south cross section covering the Delaware Formation. And I've put -- it's hung on the top of the Delaware Formation. And so the third well in is their proposed injection interval. This interval now -- you know, initially we were thinking they were going to go down to 32- -- I guess the order said that they were going to go down to 3,200 feet, and now it's down to 5,000 feet. So that 5,000-foot mark would be -- would be about 300 feet into the top of the -- of the Brushy Canyon Formation in this area.

But the second well on the cross section is the Witt #1. This well is approximately a tenth of a mile away from their proposed wells, so it's a good -- it's a good log to look at, kind of get an idea of what they're going to encounter in the Delaware Formation.

First just looking at that particular well, at the Witt #1, you know, I've marked the top of the Delaware. The top of the Bell Canyon is a dashed green line, and then I've got a marker called the Lower Bell Canyon marker. And if you look at the resistivity log on that, which is the leftmost log, you can see -- you

get a pretty nice invasion profile all the way through that Lower -- that Lower Bell Canyon interval. And in certain spots, you're getting sands where your resistivity is getting up to six, seven ohms, with 22 to 24 percent porosity. Well, we believe that's going to -- I mean, if you do a water-saturation calculation on that, that's going to calculate as a productive sand to the Bell Canyon, and it'll calculate somewhere in the 50 to 60 percent range for a -- for a water saturation. So we believe that that would be a productive interval.

Also, just going on through the cross section, just looking at the upper part of the -- looking at the lower part of the Bell Canyon Formation, I've included three -- three mud logs on here from vertica- -- from horizontal wells that we've drilled, and I've highlighted where we've seen oil shows with those green bars.

And so you can see -- you kind of have to look closely, but by the upper part of the Lower Bell Canyon, we have a light green oil cut and then also a bright green-blue oil cut in an oil well in Section 3, which this well is about a half mile away from their proposed well.

Also, you can see there is a pretty significant gas increase -- or a consistent gas increase

throughout the lower part of the -- of the Bell Canyon Formation.

And so -- and then I guess if you just look further down -- down these logs, you can see other areas, in the Cherry Canyon where we've had this consistent show throughout the -- throughout the Lower Cherry Canyon Formation, as well as down into the Brushy Canyon Formation.

One other thing I'll point out on here is the fourth well on the cross section. It's the Vasquez 4 Com #1 well. Mr. Johnson [sic] referred -- or he referenced this well a little bit, but this is one of the wells that -- that -- that is not plugged properly. And so on the left side of the wellbore, I've -- I've identified where they left 7-inch casing in the hole and then where there is open hole and then where the cement plugs are. And so you can see there's open hole basically all the way through -- all through the Bell Canyon, all through the Cherry Canyon, and again about 250 feet into the top of the Brushy Canyon. So if water were to get into this wellbore, it would be able to travel freely throughout all parts of the Delaware Formation.

I guess moving on, you can see there are some -- there are some arrows on this -- on this cross

section where I've identified where there -- where there are currently horizontal targets within this area. We're drilling at the very bottom part of the Brushy Canyon Formation right now, what we call the basal Brushy Canyon. But within a township's radius, people have drilled up here in the upper part of the Brushy Canyon, the lower part of the Cherry Canyon, as well as what I call the upper part -- or the lower part of the Brushy Canyon.

Q. And, Mr. Cless, Mewbourne has a pretty large acreage block in this area?

A. We do.

Q. So as part of your geologic study in this area, you've evaluated a large number of wells?

A. That's right. We've spent -- I mean, there has been a lot -- there are a lot of potential targets in this area. And as you can see on our land map, we have a big acreage position here. So this is -- you know, we value this acreage quite a bit. And so -- yeah. We've -- we've dug through a lot -- a lot of OCD well files. That's where you really -- you really are able to dig into these wells and into the well history of each of these wells.

So I guess the last well I'll reference on this cross section before any other questions is the

second-to-the-last well. It's the Beeman #1. It's located in Section 2 of 24 South, 28 East. It's the second well from the right. This is the well that I was talking about that is the Cherry Canyon producer. So it was initially drilled and tested in 1953. It tested the Lower Brush Canyon. And that's where Mr. Johnson [sic] got the perforations from, was from the Lower Brushy Canyon. Well, that was then.

They also tested the 2nd Bone Spring carbonates. They determined that was not productive, so in August of 1954, they came back in and did the Lower Cherry Canyon completion. And I've attached images of the OCD well record, as well as the OCD allowable for this particular well. They perforated from 4,676 to 4,684, and they did a small frac of 8,000 gallons and 8,000 pounds of sand. And that well made 15,000 barrels of oil out of those perforations.

And you can see -- you can see both on the OCD well records, as well the OCD authorization to transport. The perforations that are listed are the 4,676, the 4,684 perforations. So that's indeed where the -- where the production came from.

Q. Now, on this left-hand side of the cross section, you start the Cherry Canyon at zero. At least as to the left -- the well on the very far left, what

would that depth be -- that zero depth be to subsurface?

A. Sorry. Say that again.

Q. You know, you start -- you start with zero for the top of the Bell Canyon --

A. Oh, right. Right. Yeah. That's just -- this well is structurally hung on the top -- on the top of the Bell Canyon Formation -- or the top of the Delaware Formation. So depthwise, the top of the Cherry Canyon Formation offsetting the Gossett is going to be around 3,475.

Q. That's the Cherry Canyon?

A. The Cherry Canyon Formation.

And that's just -- effectively, I got -- 3,477 is the depth of the Witt #1, which is, again, a tenth of a mile away from the proposed wellbore.

Q. Just a couple of final questions. Do you see any -- you know, in the Cherry Canyon, in the Brushy Canyon, do you see any impermeable barriers that would prevent the migration of fluids from zone to zone?

A. No, I really don't. You know, this is -- these are all deposited -- the geologic process deposited the Delaware Formation. They're called turbidites. And they're basically these big sheet stands [sic] that are coming out in the bank and they're piling one on top of the next.

But I guess if you just look on the logs, well -- I mean, look at any of the porosity logs in through here (indicating). You know, on average, the Delaware Formation, the sands are going to be 15 to 20 percent, and even some of the higher resistivity shales are only getting down to 8 to 10 percent on the density porosity. And so I just don't believe that there's going to be -- there's going to be anything in here that's going to be a true impermeable barrier, especially when you're talking about putting in 8,000 barrels a day into this formation.

Q. Does High Roller's proposal to limit where the perfs are situated satisfy Mewbourne?

A. No.

Q. You still think there is potential for migration of fluids into other productive zones?

A. I certainly do. Like I said, I think geologically there is -- there's not -- there's not those barriers and then also the two open -- or the two wells that are not properly plugged and abandoned. I believe that those provide pathways for the water to get down into the lower parts of the Delaware Formation. So --

Q. And just one final issue. Mr. Johnston testified in his Exhibits 7 and 8, I believe, about

certain Delaware wells that were inactive. Have you looked at the data for those wells?

A. Yes, I have.

Q. And what --

A. Well, in regards -- I guess if you look back at Exhibit Number 5 --

Q. Your Exhibit Number 5?

A. My Exhibit Number 5.

-- all the -- the oil wells that are still active are going to be the vertical wells with the dark black circle that are still active. If it's an open -- if it's an open circle, then it's no longer an active well. It would be an inactive well. So you can see all the wells in Section 34 are all still active. The Witten [phonetic;sic] well in -- in 34 -- in the southeast-southeast of 34, that's an inactive well.

But for the most part, that can kind -- that can kind of clarify what -- what is an active well and what is not an active well. So the dark black circles are going to be the active wells.

Q. Were Exhibits 4, 5 and 6 prepared by you or under your supervision?

A. Yes, they were.

Q. And in your opinion, is the denial of High Roller's application in the interest of conservation and

the prevention of waste?

A. Yes.

MR. BRUCE: Mr. Chairman, I move the admission of Mewbourne's Exhibits 4, 5 and 6.

CHAIRPERSON CATANACH: Any objection?

MR. HALL: No objection.

CHAIRPERSON CATANACH: Exhibits 4, 5 and 6 will be admitted.

(Mewbourne Oil Company Exhibit Numbers 4, 5 and 6 are offered and admitted into evidence.)

MR. BRUCE: And I pass the witness.

CROSS-EXAMINATION

BY MR. HALL:

Q. Mr. Cless, a moment ago you mentioned the potential for migration of fluids. What fluids are you talking about?

A. The injection fluids.

Q. Have you calculated, yourself, the potential pressure plume for injection through the well?

A. I have not, but our engineer can testify a little bit to that, but we have not.

Q. And you indicated that you thought that the Vasquez well had been improperly plugged?

A. I don't want to say improperly plugged. I

would say that it's not going to contain fluids because it does have the open hole all the way through the -- through the Bell Canyon, Cherry Canyon and into the Brushy Canyon. So it was probably properly plugged, but if you're going to go back and put an injection well within in a half mile from it, then yes, you could say it's not properly plugged for that.

Q. Did you look at the well file to see if the OCD had approved the plugging plan?

A. I believe they had approved the plugging plan.

Q. All right. And the open hole is not a void, is it? It's filled with mud, presumably; is that right?

A. I believe they did pump mud down it, yes.

Q. Would that militate against migration into that wellbore?

A. I don't believe so.

Q. Can you explain to us -- let me ask you a question about either one of your exhibits. Let's look at Exhibit 5. That might be better. A well in the west half-west half of 34, a permitted well, is that the Yardbirds 2H? Is that right?

A. That's going to be the Yardbirds -- I couldn't tell you the exact number on it, but yeah, it's going to be the Yardbirds 34. It could be a 2H. I don't know the exact number of it.

Q. And is that a two-mile lateral?
A. No. That's a -- that's a one-mile lateral. There's a well that says "34," and then a well that says "3" that goes south.
Q. All right. I understand.
Can you explain why Mewbourne's development program has focused on the Wolfcamp and the Bone Spring to the exclusion of the Delaware?
A. For the -- as I previously mentioned, a lot of the -- a lot our current development is Wolfcamp. For one, the economics are very good for the Wolfcamp Formation, and two, we're able to hold -- we're able to hold 320-acre unit per mile -- a 320-acre unit per mile. So we have a lot of lease obligations. A lot of this -- a lot of this acreage in here is broken-up fee acreage and fee leases. And so we're going in and basically holding what we can and then coming back and developing -- developing a lot this stuff at a later date.
Q. The proposed wells in Section 34 and in Section 3, your Delaware proposals, has Mewbourne run the economic cases on any of those wells?
A. Yes.
Q. And has it been presented to management?
A. Yes.

Q. Has it been accepted?
A. Yes. We recently -- I mean, a lot of the -- the first well -- the first Delaware well we built was in the west half-west half of 35. Mr. Johnson --
Is it Johnston or Johnson?
MR. JOHNSTON: Johnston.
THE WITNESS: Okay.
He even mentioned that as being a very good well. And so we've subsequently -- within the last six months, we've drilled a well in Section 3, and we're happy with the results. And so it has -- management is on board. And so it is an economic play for us right now.
Q. (BY MR. HALL) All right. You don't have those to present to us today?
A. No, sir.
Q. On your Exhibit 6, Mr. Cless, can you look at -- on those logs where you show oil shows in the Lower Brushy Canyon -- basal Brushy Canyon, why have those accumulations, if there are any, remained at that zone?
A. There could be -- could be for a number of reasons, but, you know, there could be low structural traps. I would also -- I mean, I would also say that it's -- the source of the oil is probably from the

Avalon Shale, which is just below that, and so it's being trapped just above that in the Delaware sand -- or in the basal Brushy part of the Delaware sand.

I would also point out, you know, there are a number of wells on this cross section which have oil accumulations out of some of these other -- Upper Cherry Canyon zones and Brushy Canyon zones.

Q. That explains the trapping in that zone?

A. In a basal Brushy Canyon?

Q. Yes.

A. It could be -- it could be a stratigraphic trap. It could be structural trap. It could be a number of things.

Q. Is it possible it's there due to something that's not reflected on the logs?

A. I would say -- yeah. I mean, this is a highly complex zone. And we're looking at, you know, one or two data points per mile, and so -- so yes, I would agree with that.

Q. And about the Yardbirds 2H well, the APD for that well expired -- has been allowed to expire?

A. I don't know off the top of my head.

MR. HALL: Nothing further.

CROSS-EXAMINATION

BY CHAIRPERSON CATANACH:

Q. Mr. Pearson [sic], on your -- on your -- you identified the Upper Brushy Canyon, but on your -- on your type log, would that be that interval between the blue line and the brown line?

A. Yes, sir. I guess we kind of -- like I said, we kind of focus on the basal Brushy Canyon. So yeah, that would be that upper part, 500 feet below the top of the Brushy Canyon, what I would call the Upper Brushy Canyon.

Q. And that interval is productive to the southeast?

A. Yes. If you look back at Exhibit -- Exhibit 5, there is a well that -- I guess the last well on this cross section located about three miles to the south in Section 15. It produced 33,000 barrels of oil out of that Upper Brushy Canyon sand.

Q. And it looks like there is production also to the northeast on that Upper Brushy Canyon?

A. That's correct.

And then again that horizontal field further to the south is all out of that Upper Brushy Canyon field, and then there is a lot of vertical production, like you mentioned, over in -- just southeast of 24-29. But the closest well is down in Section 15, about three miles away.

Q. How did the zones in the Cherry and the Bell -- the potential producing zones, how do those compare to what you're seeing in the Lower Brushy Canyon in terms of visible quality thickness potential?

A. I would say it's -- it's not as consistent. I mean, you can see, with that big vertical field sitting in this area, the quality of the rock and the consistency of the -- it really comes down to the -- you move quite a bit of fluid, but it comes down to the oil cuts and the water cuts. And for whatever reason, that Lower Brushy Canyon zone tends to have a higher -- a higher oil cut and a lower water cut. But there are -- but -- and it's just a little thicker zone.

But these Upper Brushy Canyon sands and the Lower Cherry Canyon sands, you know, they're pretty consistent. You can still map them fairly regionally, and they're just not as consistent, I would say, as in the basal Brushy Canyon.

Q. Is the water saturation higher in those upper zones?

A. It totally depends. You can look at the first well on this cross section, located in Section 15 of 23-28. I guess I should have mentioned, on that map, the numbers that are off to the right of each wellbore, that represents cumulative gas. The black number is

oil, and the blue number is water. So you can see that well in Section 15 of 23-28. It made 28,000 barrels of oil and 57,000 barrels of water. And so it's -- I mean, it's comparative to some of the -- some of the basal Brushy stuff.

But it's -- it's -- I would say, on average, a vertical Delaware well -- a good Delaware well is going to make 30 percent oil cut, but it's common to make anywhere from 5 to 10 percent oil cut on upwards to 30, 40 percent. So --

Q. So there has been horizontal development, I guess, in the -- in the Cherry Canyon down to the southeast here?

A. That's correct.

Q. Are those wells economic?

A. Those wells, they're half-mile -- for the most part, they're half-mile laterals.

These were -- if I can mention, these were some of the first Delaware wells that were drilled in New Mexico. At today's prices, it probably wouldn't be economical, but -- but that was also -- you know, over the last five years, we've really honed in on different types of fracs, different types of completions. We've improved -- we've improved our completions quite a bit, even from two wells which are right by each other. You

know, we've changed from a cross-link job to a slick-water completion job, and we've seen noticeable results. So a lot of these are older completions. They didn't pump quite as much sand as we would pump today. And so I think that with current completion techniques, that we could make it economic.

Q. And if the price of the oil goes higher, that just improves the economics of those wells?

A. Certainly. And these wells -- you know, these wells are 4,500-foot TVD wide, and so the cost of drilling these things isn't astronomically high.

Q. Let me ask: Is it Mewbourne's position that this application should be denied entirely?

A. Yes, it is.

Q. You just don't want them injecting anything in this Delaware?

A. We've seen -- and I can let my next guy -- or our next -- our engineer get into more detail. But we've done more regional studies of the Delaware, and we've seen a lot more problems with these Delaware SWD wells, which we've now -- we're -- we're -- we've operated Delaware wells in the past, but we're -- in the last three months, we've built three Devonian wells. One of them being in Section 27 of 23-28.

And Mr. Cude can testify to how much that

well -- that well will take. I mean, it will take more water from the Delaware well. I believe it tested up to 25,000 barrels a day.

So we're getting out of the Delaware business -- the Delaware SWD business. We were -- in this area, they referenced the BK SWD well -- or the B -- the BK -- or the Trek Operating injection well. A lot of our water was being sent to that well. Now all of our water is going up to our own Devonian SWD well, again because we've seen the impacts of the Delaware SWD wells in other areas, and we're just kind of applying it up into here. So -- so we're trying to get out of the Delaware injection well -- well business.

Q. Okay. On your -- on your exhibits, you've got some frac gradients for certain wells in this exhibit.

A. Uh-huh.

Q. Those were -- those are Brushy Canyon?

A. It depends. I mean, some of them are Cherry Canyon. Some are Bell Canyon. Some are Brushy Canyon. I'll let Mr. Cude get into more detail on those.

Q. Okay.

CROSS-EXAMINATION

BY COMMISSIONER PADILLA:

Q. Can you speak at all about Mewbourne's development schedule for this area as it relates to the

Delaware? I know it's a -- question --

A. Yeah.

Q. -- but --

A. Like I said, we -- we just drilled a well about six months ago. We're -- we're pleased with it. We're evaluating it.

Right now we're -- because of the leasehold and stuff, we're more focused on the deeper formations, specifically the Wolfcamp Formation. So I don't believe -- in the next 12 months, I don't believe we have any on the rig schedule. I know if you were to look two or three years out, we definitely have some plans. You can see how many wells we've staked. And we have permits out here which we have filed, and those have a two-year expiration on them. So I'm sure we'll get those renewed when we can.

But, you know, we're not just sitting out here sitting on the Delaware waiting. It's -- you know, the first well we drilled, you know, it's a cheap well, and it's made 200,000 barrels in about three years. So it's one of the most economic plays we can drill now. But just for other reasons, we're kind of focusing on holding lease and maintaining leasehold. So -- so I hope that answers your question.

Q. Yeah.

And I want to touch on what the Chairman talked about. No solution? No compromise on this?

A. We don't believe so. We just think with the rates they're asking for, as well as -- especially now that the depth is back into the Brushy Canyon Formation, as well as what else we're seeing in the -- in just the greater part of the Delaware Basin in New Mexico. Like I say, we're trying to get out of the Delaware business. So --

Q. Thank you.

A. Uh-huh.

CROSS-EXAMINATION

BY COMMISSIONER BALCH:

Q. Seems to me that most of your objections to the Gossett well also apply to the Pearl #1 --

A. Correct.

Q. -- the existing saltwater disposal well?

A. If you look at the rates that that well is injecting in, it's a lot less than what they're proposing. That well I believe was drilled back in 2011, before we really got going in this area, before we put -- back then, the only thing we had was Section 35. Since then we have -- we have obviously built our infrastructure out here. and a lot of that -- a lot of water that was going to that well was Mewbourne's -- was

Mewbourne's. Our horizontal wells were contributing a lot of water to that. Like I said, we've seen the problems with the Delaware, and so we -- you know, we're taking everything to our Devonian SWD well now.

Q. Who operates that Pearl #1?

A. Trek Operating.

Q. Trek Operating?

A. Correct.

Q. And we had testimony earlier that they're taking water probably today.

A. Uh-huh.

Q. Do you know what the rates are?

A. Like I said, I believe it was averaging like 2,000 barrels a day. But we drilled our Layla Devonian well -- we completed it, I believe, within the last two months. And so I'm sure that their injection rates are a lot lower than what they were. So I couldn't give you specifics, but I'll bet they're -- they're definitely below 2,000 barrels today.

Q. Sounds like High Roller thinks there is a market for well cap water, Bone Spring water. Why wouldn't that apply to the Pearl #1?

A. I don't know if it's -- I believe that they had an interest -- they have an interest in some of our stuff in this area, so I don't believe that their -- I

could be wrong, but I don't believe their well is a commercial disposal well. They operate a lot of the wells in Section 34. That's where -- Trek Operating and BK Operating is the same parent company, and I believe that that's where a lot of their water was coming from, their own produced water. So I don't believe that it is a true commercial disposal well. Like I said, they have interest in some of our wells. That's why they're able to take -- that's why they were able to take our produced water. So --

Q. Thank you.

CHAIRPERSON CATANACH: Mr. Brancard, any questions?

MR. BRANCARD: No.

CHAIRPERSON CATANACH: Anything further?

MR. HALL: No.

MR. BRUCE: No, sir.

CHAIRPERSON CATANACH: This witness may be excused.

I guess we'll go forward.

TRAVIS CUDE,

after having been previously sworn under oath, was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Would you please state your name and city of residence for the record?

A. Travis Cude.

Q. Who do you work for and in what capacity?

A. I'm a reservoir engineer for Mewbourne Oil Company.

Q. Have you previously testified before the three-member Commission?

A. Yes, sir.

Q. Have you testified --

A. Oh, no. Excuse me. No, I have not.

Q. Have you testified in front of the Oil Conservation Division?

A. Yes, sir.

Q. And were your credentials as an expert reservoir engineer accepted as a matter of record?

A. They were.

Q. Can you summarize your educational and employment background for the Commissioners?

A. I graduated from the University of Oklahoma in 2012 with a bachelor of science in petroleum engineering. I had two internships with Mewbourne Oil Company. During that time -- an internship with Devon

Energy during that time. I went to work full-time with Mewbourne Oil Company in 2012, and I have been a reservoir engineer ever since, working New Mexico since 2013.

Q. And are you familiar with the engineering matters related to this application?

A. I am.

MR. BRUCE: Mr. Chairman, I tender Mr. Cude as an expert reservoir engineer.

MR. HALL: No objection.

CHAIRPERSON CATANACH: Mr. Cude is so qualified.

Q. (BY MR. BRUCE) Mr. Cude, let's first talk about frac gradients. And there is some data on Exhibit 5, for instance. Do you discuss frac gradients not only in this area but -- take a step back. Have you conducted regional studies of frac gradients in the Delaware and other matters related to the water into the Delaware Formation?

A. We have. And you can see right here on the map that he was referencing, we drilled two Brushy Canyon wells, one in Section 3, one in Section 35. They were hydraulically fractured, and so from that, we have an initial shut-in pressure. And with that, we calculated frac gradients of .6 psi per foot and .59 psi per foot.

Like I said, those were in the Brushy Canyon.

We've also looked through this area trying to determine the frac gradients we see in other wells. So in Section 24, 24 South, 28 East, the Cherry Canyon producer in unit letter D, we calculated a frac gradient of .57 psi per foot. And in the Bell Canyon well, in unit letter B, we calculated a frac gradient of 0.67 psi per foot.

So I'd like to mention -- I mean, that's within -- certainly the Bell Canyon frac gradient is within the range that Mr. Johnson [sic] thought that we would see in the Delaware.

And like Mr. Bruce mentioned, we've done more digging into this regionally, and I think you see the same thing holds true here. We've run sonic logs, come up with frac gradients through the Delaware. And what we've seen is that this is pretty consistent data to other places where we have that science, where you have a, you know, normal frac gradient in the Bell Canyon, but as you get into the Cherry Canyon, down into the Brushy Canyon, that frac gradient actually decreases going downward. And we are concerned with and have seen the migration of fluids from injection intervals limited to the Bell and Cherry Canyons, down into the Brushy Canyon and, for that matter, also down into the Bone

Spring Formation.

So I think, like Mr. Cless testified before, you know, this is something that we have recently seen, we've recently been working on. We've been working with other operators in the area. And like he said, that's why not only are we trying to move ourselves out of the Delaware Formation for saltwater disposal, but we're also, you know, trying to raise these issues with other operators so they do the same thing.

Q. Now, you mentioned -- and it's on a couple of the plats -- Mewbourne's Devonian injection well -- SWD well in Section 27. That well has been drilled; has it not?

A. Yes, sir.

Q. What type of injection rates has it tested at?

A. We tested it to 27 -- or about 25,000 barrels per day. It's currently taking about 8,000 barrels of water a day. With just friction pressure, it's about 250 psi at the surface. And like we mentioned, that's now all of our produced water in this area that is going to that Devonian disposal.

Q. And Mewbourne has no objection to a Devonian SWD well in this area?

A. We do not. In fact, we tried to work with

other operators, and I believe we brought it to High Roller's attention initially that that's what we preferred. And -- I mean, yes, we are working with other operators who would like to go to the Devonian.

Q. Okay. Let's go to your Exhibits 7 and 8. Could you explain those briefly for the Commissioners.

A. Like we mentioned, these are wellbore diagrams, the wells within the half-mile radius of the proposed Gossett SWD. And it just shows the -- the current wellbore schematic after these wells were plugged. And that -- this isn't to scale, but you can see I've highlighted effectively where the approved injection interval would be in blue. The original injection interval approved by the Commission in the last hearing was 2,600 to 3,200 feet. And so as you can see, that's open-hole formation there.

Here in the Vasquez 4 #1, they cut and pulled casing at 5,006 feet. So from the bottom of the cement plug set over the Montesave 2 [phonetic] to either 4,946 where the top of the cement plugs was or 5,006 feet where the casing was cut and pulled at, that's open formation that water injected into the Bell Canyon, into the Cherry Canyon, would be able to migrate down into the Brushy Canyon.

And, you know, through that interval -- I

think we've shown, you know, their -- their productive zone's within there, too, and so that causes us great concern.

Q. So combined with Mr. Cless's testimony about the lack of impermeable barriers, this really increases your concern of containment of injected fluids, the salt water, into the permitted zone?

A. That's correct.

Q. And if High Roller's application was approved, if they applied for higher injection pressure, would that cause you additional concern?

A. It would.

As we mentioned on the frac gradient in the area, we believe currently with the OCD's allowable of .2 psi per foot at the surface, plus the fluid injection -- the hydrostatic injection gradient, you know -- like he mentioned, Mr. Johnston did, a lot of the water that will be injected into this well is from wells producing from the Delaware, the Bone Spring, the Wolfcamp. Our experience shows us that the hydrostatic column -- the hydrostatic gradient of that column of fluid would be about .45 psi per foot. So if you add the .2 psi per foot allowable at the surface, plus the hydrostatic gradient, that puts you at .65 psi per foot, which is right in the range of the frac gradient of the

Bell Canyon but above the frac gradient of the Cherry and Brushy Canyon.

Q. And one more thing about development of the Cherry Canyon and potentially the Bell Canyon. Do you agree with Mr. Cless that a lot these other zones such as the Bone Spring and Wolfcamp, which weren't commercial with vertical wells, are commercial with horizontal wells, correct?

A. That is correct.

Q. And technology continues to improve it?

A. It does. And costs continue to decrease as the technology improves, and that just further improves the economics and, you know, the different zones that can be targeted.

Q. Were Exhibits 7 and 8 prepared by you?

A. They were.

Q. And in your opinion, is the denial of High Roller's application in the interest of conservation and the prevention of waste?

A. It is.

MR. BRUCE: Mr. Chairman, I move the exhibits of Mewbourne, Exhibits 7 and 8.

MR. HALL: No objection.

CHAIRPERSON CATANACH: Exhibits 7 and 8 will be admitted.

(Mewbourne Oil Company Exhibit Numbers 7 and 8 are offered and admitted into evidence.)

CHAIRPERSON CATANACH: Mr. Hall.

CROSS-EXAMINATION

BY MR. HALL:

Q. Mr. Cude, you indicated that Mewbourne had undertaken a study of the effects of injection into the Delaware?

A. That's correct.

Q. Are you able to provide us with that study today?

A. I cannot present the study. I can tell you that the findings of the study have shown that the, as we mentioned, water that is being injected into the Bell Canyon and Cherry Canyon is moving -- migrating downward through the Delaware Mountain Group into the Bone Spring. I think BOPCO has seen similar issues and have brought those to the Commission.

Q. And where are the BOPCO issues? Over Poker Lake?

A. Yes, sir.

Q. And it's substantially east of this property?

A. It is.

You know, with -- we've seen directly

southeast of here, right across the state line, Block 56-1, Mewbourne had a -- Mewbourne drilled an Avalon Shale well offsetting a Delaware disposal, and we -- we produced about 2,000 barrels a day naturally after perfing the toe. We dug into the area and saw the -- saw the Delaware disposal rates, you know, averaging around 10,000 barrels a day. They had -- you know, not only had our well been knocked off or had seen the water impact while we were drilling, but producers in the area that were making 40 barrels a day at a million Mcf a day had then seen a water increase to about 2,000 barrels a day. And, you know, an increase in productivity like that showed us that this water has to be coming from an outside source.

So the study we've undertaken has been in New Mexico, in Eddy County. It's been in Lea County. And the results we're seeing are comparable to that.

Q. Did you participate in the study?

A. I did.

Q. Did your study conclude that if there is to be fracture propagation from the injection, the preponderance of that propagation is upward?

A. No.

Q. Explain. Did you conclude that preponderance is downward?

A. We did that. As I mentioned, though, we've seen that the frac gradient actually decreases from the Bell Canyon, into the Cherry Canyon, into the Brushy Canyon and into the Avalon Shale, so the preferential migration direction would be then downwards rather than upwards.

Q. What has been the experience with your injection operations in the Devonian, in Section 27, with respect to -- have you seen prospective fracture propagation there?

A. We have not.

Q. You've observed none?

A. We have not observed any.

Q. Have you tested for it?

A. We have not.

Q. Is there a step-rate test on that well?

A. There is not.

MR. HALL: No more questions.

CROSS-EXAMINATION

BY CHAIRPERSON CATANACH:

Q. Mr. Cude, there was some testimony presented today about the area that might be influenced by this proposed injection well. I know you haven't had time to calculate anything on your own, I assume, but do you generally agree with that, that the area affected will

be approximately 700 feet?

A. I have not had time to do that study. I would imagine, you know, if that's a waterflood calculation, the -- the pore space is not empty as it stands, and so the -- the radius of the fluid migration at 700 feet away from the wellbore, that's just the injection fluid, not the fluid that's already in situ. So the radius actually affected is greater than that.

Q. The study you're talking about, is that anywhere near this area, one of the studies you've done?

A. The study is regional. We do have data points in 26-28 and 26-29, 26-32. But like Mr. Johnston mentioned, you know, the Delaware Formation, which is a layer-cake formation, a lot of the results we're seeing -- and we've kind of confirmed this with similar frac gradients here, that that would be a similar issue here.

Q. Is it your understanding that in the area of this disposal well that there is potential near wellbore in the Delaware that Mewbourne sees?

A. Yes, sir.

Q. Potential for production?

A. Yes, sir.

Q. Not far away from the wellbore but in this whole area?

A. Yes, sir.

Q. Are there any other potential disposal intervals that someone could use in this area besides the Delaware?

A. Yes, sir.

We mentioned the Devonian well. The Devonian -- ours is not the only well in the Devonian, Section 27. In the -- in the very near area, there is also a disposal well in the Devonian, in Section 36 of 23-27, and it had similar tests on what we have seen as well. We drilled one a little bit further west in 23-27. There have been quite a few disposals recently completed to the southeast in the Devonian. So we really see no indication that the Devonian is not an appropriate or capable injection zone within this entire area.

Q. How deep is your Devonian disposal well?

A. It is TD'd at 15,000 feet. The top of the injection interval is 13,999.

Q. So you're talking about an extreme -- a lot more cost to drill to the Devonian interval?

A. After our surface facilities were put in place, we show an all-in cost of $4 billion. It was about $3 million at TD.

You know, I would think that a simple

calculation -- you know, if you look at this area -- I believe our previous testimony in the initial hearing was that we looked at a nine-township area around this proposed well, and the maximum injection pressure average -- or the maximum injection volume averaged over a month was 5,476 per day. That's the maximum. The average injection volume over this area was only 2,700 barrels per day.

MR. BRUCE: Is that in the Delaware?

THE WITNESS: In the Delaware. Excuse me.

And so being able to inject an order -- you know, an order of magnitude ten higher than that in the Devonian than that average -- I certainly don't believe that the cost to drill a Devonian well is ten times the cost to drill and complete a Delaware well. So it's certainly within the range of possibility.

Q. (BY CHAIRPERSON CATANACH) So you believe they could drill commercial well that's in the Devonian -- a commercial disposal well in the Devonian?

A. I do.

I don't know that our objection is with commercial disposal in this area. It's with the disposal into the Delaware Formation.

Q. If we approve this application and we required remedial operations on the two PA'd wells, would that

solve your problems?

A. It would not.

Q. Because?

A. Because we believe the frac gradient of the Delaware is low enough such that the injected volume would still migrate through the formation downward into the productive zones.

Q. I have nothing further.

COMMISSIONER PADILLA: No questions.

CROSS-EXAMINATION

BY COMMISSIONER BALCH:

Q. I think I got a question from Mr. Hall that the Bell and Brushy Canyon are under pressure compared to the injection interval?

A. The Bell and -- excuse me?

Q. You're talking about downward migration of fluids --

A. Yes.

Q. -- right?

A. Yes.

Q. So you have conduit, and you have pressure gradient?

A. Correct.

Q. How is that going to be achieved?

A. The downward migration? Because the injection

pressure at the perforations will be high enough that the parting pressure of the formation preferentially will be downward rather than upward.

Q. Okay. That gives you a conduit, right?

A. Yes.

Q. And you need to have a pressure sink to move water from one interval to another, right? You have to have a straw down there sucking fluid out, or the zone has to be under pressure?

A. Well, there are Brushy Canyon producers -- Lower Brushy Canyon producers, so that could certainly create a pressure sink.

Q. So you talk about your regional study. You mentioned a few sites. How many total sites did you study in that?

A. There are about six different areas regionally, but within those areas, there are certainly multiple samples.

Q. So six regional areas. And then how many of those did you see problems with Delaware injection water going where it wasn't supposed to?

A. Well, I suppose then I would say that we -- we attempted to study the entire basin from about 23 South to the state line and then past the state line, and so the areas where we saw problems -- you know, there are

six very definitive areas where we saw problems regionally spread out. It wasn't isolated to a certain area. Does that answer your question?

Q. I'm trying to figure out how common this problem is with Delaware injection regionally.

A. Again -- I mean, I think the frac gradients here show you it is a big problem regionally.

Q. So in all of those six or seven study areas, this type of effect that you're predicting?

A. Yes. So -- I guess the study area was 23 South to the state line. We came up with six broad areas where we have seen this problem. And so those areas are spread out, and then within those certain areas, I mean, multiple wells have watered out within those six areas.

Q. Thank you very much.

CHAIRPERSON CATANACH: Just one.

RECROSS EXAMINATION

BY CHAIRPERSON CATANACH:

Q. Does this problem extend into Texas?

A. It does.

Q. Has there been anything addressed by the State of Texas on this issue?

A. I don't know that the issue has been brought up in Texas. Certainly in New Mexico, you have a .2 psi per foot at the surface allowable. In Texas, it's .5

psi per foot. Certainly -- you know, BOPCO operates a lot of wells in New Mexico, and they tried to lead the charge on this initially. As we've seen this problem arise, we've been very active pursuing it. Our acreage position isn't very large in Texas. And so, you know, where we have our money invested is in New Mexico, so we've been very proactive in trying to protect that asset. The acreage we have in Texas, we believe the damage is really already done, and so there's certainly not a lot of incentive for us to lead the charge as we have in New Mexico. But the problem does exist.

Q. As I mentioned, this issue has been brought to the attention of the Division in recent months. And I believe that we are in the process of probably forming or at least joining some of the discussion with the operators with regards to this issue. So we are aware of it, and we plan on addressing it somehow.

I have nothing further.

MR. BRUCE: I have nothing further of this witness.

MR. HALL: We'd like to present some rebuttal testimony, if we can. Do you want to do that now or come back?

MR. JOHNSTON: It'll be short.

MR. HALL: It'll be brief.

CHAIRPERSON CATANACH: Yeah, we can do it now.

Exhibits?

MR. BRUCE: I did move the admission of Exhibits 7 and 8.

CHAIRPERSON CATANACH: Okay.

RICK JOHNSTON,

after having been previously sworn under oath, was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. HALL:

Q. Mr. Johnston, since the time that we were provided with copies of the Mewbourne exhibits which pointed to some concerns with the Vasquez and Pardue well completion and abandonment, did you have the opportunity to look at that issue and generate some more exhibits that are responsive to that concern?

A. Yes. Yes, sir.

Q. All right. Start with Exhibit 13, and tell us what you did to evaluate that issue?

A. Exhibit 13 is a -- what I referred to earlier as the results of a pump-in test on a well completed down in Texas a mile or two from the state line. And what we did was we went in to size the pumps for this well after it was initially perforated. We went in and

did a pump-in test, and the way we did the test, you could take the data and treat it as though it's a step-rate test, which is what I've done here.

The first two rates were at 4.4 barrels a day and 5.6 barrels a day -- excuse me -- per minute. The rates are per minute. And you can see the corresponding surface pressure.

I've accounted for friction, and I've calculated the bottom-hole pressure, and I've calculated the gradient. You can see that during this pump-in test, the bottom-hole pressure gradient varied from about .65 up to about .67. The first two points, I believe, are not valid. They fall off of the trend line. And I think what we were doing during that period is we were opening up additional intervals because if -- well, I don't -- I didn't bring the copy of the log. You have multiple sands that were perforated over an interval that spans from 3,214 to 3,738. So I believe those first two points, if you look at the chart, you can see that they fall off of the trend, but you can see that the other points establish a trend. And at these rates, we never saw the step-rate test fall over -- fall over where it was demonstrating that we were fracing the formation.

Taking the 12-barrel-per-minute rate and

the bottom-hole pressure, I've gone into Darcy's flow equation and calculated the permeability of the well, just to get a feel for what is the permeability of the Delaware at this location, about 15 miles to the south, and it's about 78 millidarcies.

Exhibit 14 is a log section from the Witt well, which is very close to the proposed Gossett location. On the resistivity log, I've gone in and highlighted those sands that exhibit good low resistivity associated with high porosity. And those intervals that are highlighted in orange amount to 490 feet of interval, and that spans from, roughly, 2,650 down to 34- -- excuse me -- 3,340.

I've taken those -- that thickness and the permeability and the porosity -- I guess the other thing to look at is you can see, on Exhibit 14, most of those sands that exhibit low resistivity have porosities up on the range of 24 down to 18 percent, averaging roughly 22 percent.

Exhibit 15 is a multipage exhibit. What I've done is I've gone in and done a pressure front calculation. I've used the 78 millidarcies, 490 feet of thickness, 22 percent porosity, injection period for ten years. And this calculation is out to the HNG well down to the south, which has the big open-hole section. So

what I'm doing in this calculation is showing you what kind of pressure increase is going to occur at that well at varying injection rates.

The first page is at 17,5 [sic]. You can see that we're going to increase the reservoir pressure at that well by 171 psi. At 8,000 barrels a day, we're going to increase it by 78 psi.

Third page, at 5,000 barrels a day, we're going to increase the reservoir pressure by 49 pounds.

And then the last page is at 4,000 psi. If the well behaves average, like Mewbourne says, that's probably all we'll be able to achieve. We're going to increase the reservoir pressure at that well by 39 psi. That -- that problem well is full of mud. I would expect that that would mitigate cross-flow abilities. Is it going to completely stop it? I don't know that anybody can say it would.

But we just wanted to show you these are the magnitude of the pressure increases that this proposed injection operation would have at that well, and that is limited to this upper portion of the injection interval. If we were able to add more interval, you know, the pressure would be less -- the pressure increase would be less.

Q. Do Exhibits 13, 14 and 15 substantiate your

conclusion that injection fluids will remain contained?

A. I believe they will.

And Exhibit 13 is somewhat of a demonstration that shows that the frac gradient, now it's not the same well. For another Delaware well, it's going to be higher than .67.

Q. All right. So a larger injection interval, if we go back to the original request, that will result in lower pressures over a greater vertical extent?

A. That's right.

Q. Did you create Exhibits 13, 14 and 15?

A. I did.

MR. HALL: That concludes my rebuttal direct of Mr. Johnston. I'd move the admission of Exhibits 13, 14 and 15.

MR. BRUCE: No objection.

CHAIRPERSON CATANACH: Exhibits 13, 14 and 15 will be admitted.

(High Roller Wells, Inc. Exhibit Numbers 13, 14 and 15 are offered and admitted into evidence.)

CROSS-EXAMINATION

BY MR. BRUCE:

Q. Just one question on your Exhibit 13. I'm looking at the gradient at the top of the

injection -- injection zone, I should say.

A. Yes. I believe that calculation is -- it is very close to the top of the perforated interval, which is at 3,214. That well is not perforated at the top of the Bell Canyon. It's perforated about 400 feet below the top of the Bell Canyon down into the Cherry Canyon.

Q. So if you were injecting above the frac gradient, you wouldn't notice anything anywhere?

A. I think what you're trying to ask me is it possible that all of the -- all of the points in this pump-in test are above the frac gradient. I guess that's possible, but we don't believe that that's the case because you still have a steady increase in the bottom-hole pressure. In a step-rate test, generally when you do get to the inflection point, things flatten out in that curve pretty quickly, and the pressure increase from point to point is quite small as you extend the fracture.

Q. Is that for a limited reservoir only, just one zone, rather than injecting into multiple Delaware zones like you're talking about in the proposed High Roller well?

A. I don't believe that it's going to behave differently.

MR. BRUCE: That's all I have,

Mr. Examiner -- Mr. Chairman. Old habits die hard.

CHAIRPERSON CATANACH: 23 years' worth.

CROSS-EXAMINATION

BY CHAIRPERSON CATANACH:

Q. The pressure-pump calculation, that's the -- to -- which well is it to?

A. I believe it's to the HNG Vasquez.

Q. And that looks to be about half a mile?

A. It's the HNG Vasquez, which is the well on the Mewbourne Exhibit Number 6 that they had labeled as having the large open hole. That well is located down at 6:00, just right on the half-mile line.

Q. There's been a lot of discussion about this -- this interval that comprises the 490 feet of good sand, 2,600 to 3,350 or approximately there.

A. Yes, sir.

Q. If we were to approve the whole injection interval from 2,600 to 5,000, would you perforate additional zones below that 33?

A. If you directed us not to, we wouldn't. If you approve the whole interval and didn't give us any direction in that regard, we would probably -- the way I generally complete these wells is I'll perforate about 350 interval starting at the bottom so that if somebody messes up and pumps a bunch of gunk in the well and

clogs it up, we've still got more sand up the hole to perforate.

Q. Okay.

COMMISSIONER PADILLA: Nothing from me.

CROSS-EXAMINATION

BY COMMISSIONER BALCH:

Q. Just one question, vertical versus horizontal permeability for the Brushy Canyon. I know areas of it are laminated sandstones. Can I have a high ratio?

A. I don't -- I don't have a feel for what that ratio is going to be, but I will point out that the mud log shows and the producing intervals that are productive in the Delaware, they are discrete and they're correlated. While we can't see things on the logs that we can say, Aha, that is the seal, there has to be a seal out there that we maybe aren't recognizing on the logs that don't have the normal character. There have to be some seals. Otherwise you wouldn't have these localized accumulations the way we do.

Q. Thank you.

CHAIRPERSON CATANACH: Anything further of this witness?

MR. HALL: Nothing further. Thank you.

CHAIRPERSON CATANACH: This witness may be excused.

So anything further on your direct case?

MR. BRUCE: No, sir.

CHAIRPERSON CATANACH: And are you basically done, Mr. Hall?

MR. HALL: We're finished.

CHAIRPERSON CATANACH: Okay. Let's go ahead and break for lunch at this point -- okay. Let's recess.

(Discussion off the record.)

MR. HALL: We can waive closing statements if you'd like to proceed.

MR. BRUCE: I have one, but it's very brief -- or short. If Mr. Carr was here, I'd say a "short closing statement."

CHAIRPERSON CATANACH: Okay. Yeah. We might just plow through this then. Go ahead and give your brief statement.

CLOSING ARGUMENT

MR. BRUCE: Mr. Examiner [sic], mostly it consists of a couple of cases. Again, as you inquired, we deny that the application of the entire Delaware is prospective, and we do not want to waste resources or impair correlative rights. There are a couple of things to look at. Let me hand out a couple of cases. They are not directly on point, but I think I can just very

briefly discuss them.

Mr. Examiner, the first one is an IBLA case, Penroc Oil Corporation. Again, it's not quite on point. 84 IBLA 36 is the number in the decision. In that case, a company desired to go enter an abandoned well on an existing oil and gas lease, and the lessee objected, saying that it might to want use that well in the future for its own operations.

I think the main reading of this case is simply the IBLA denied the SWD application, and I think it shows the ferment [sic] of the IBLA to the mineral interest owner, the owner of the dominant estate. And I think that should occur here, since both Mewbourne and COG own the oil and gas working interest on the well site, and if they want to utilize that for future development, I think they should be given -- I think their desire should be paramount.

The second case is the Snyder Ranches case involving a SWD well. The only thing I would point out there is High Roller's testimony is that the well, if it's allowed, will inject outside the -- into adjoining leases, and certainly there is an issue with that as shown in the Snyder Ranches case. In that case, the Court decided that the Division and the Commission had correctly stated that there would be no flow outside of

the pertinent leaseline. We do not have that here.

Again, I think you should look at these cases to show that you should not grant approval to do something that may impair not only the correlative rights of Mewbourne but the adjoining interest owners.

And there is one other thing that I need to mention. In ordering paragraph number five of the Division's order, it required the logging of the well to determine if there was productive -- if the zones that were being injected into were potentially productive.

There is an issue there because as owners of the oil and gas leases, COG and Mewbourne own the right to explore or develop these zones, and part of that is logging the zones. I don't know that High Roller has that right.

So we would ask you to deny the application.

Thank you.

CLOSING ARGUMENT

MR. HALL: I'll briefly address.

We've seen Penroc and Snyders Ranches before. Penroc -- I've used this case myself -- specifically limited to wellbores on mineral leases case of BLM lease BLM expressly retains ownership of the wellbore. In the Land Office state that's not the way

it is on fee acreage. This is fee acreage.

Snyder Ranches -- I think what Mr. Bruce is suggesting here is that by virtue of the oil and gas lease exhibits they introduced earlier today, that testify they have some right, other than the very limited right in the oil and gas leases which give you nothing more than explore for and remove hydrocarbons. Period.

I don't think we should get into the ownership of pore space. I think that's what Mr. Bruce is suggesting we do. I think we should stay away from that. It's not an issue in this case. I think it's not beyond the province of the Commission, frankly, to delve into that issue.

I think we've sufficiently addressed the waste issue and the productivity issue in the area. I think we've addressed the containment issue in rebuttal testimony and some of the direct testimony on that issue.

I'd point out to you I think you will recognize that this is a different operation than the Division is used to seeing. This is a high-class, high-end facility that you ought to find a way to make it work in this situation.

There was some suggestion today by Mr.

Bruce and his witnesses that we abandon injection into the Delaware. I think that's premature. Granted, it's a subject for a future study, but right now I think there is sufficient evidence in front of you to warrant approval of an injection facility for the Gossett project.

That's all I have.

CHAIRPERSON CATANACH: Thank you, Mr. Hall.

Okay. We'll -- do I have a motion to go into executive session?

COMMISSIONER BALCH: I'd make a motion to go into executive session.

COMMISSIONER PADILLA: Second that.

CHAIRPERSON CATANACH: All in favor?

(Ayes are unanimous.)

CHAIRPERSON CATANACH: It's fine with the witnesses being dismissed.

MR. BRUCE: Thank you.

(Recess 12:33 p.m.; Executive Session 12:34 p.m. to 12:56 p.m.)

CHAIRPERSON CATANACH: We are back on the record.

COMMISSIONER BALCH: On that note, I'll make a motion to go back on the record.

COMMISSIONER PADILLA: Seconded.

COMMISSIONER BALCH: All in favor?

(Ayes are unanimous.)

CHAIRPERSON CATANACH: We have reached a decision in this matter, and I will let Mr. Brancard tell you.

MR. BRANCARD: Would the Chairman say the magic words, "We're going back on the record"?

CHAIRPERSON CATANACH: Oh, yes. I always forget that.

I will just state that during the executive session, we discussed only this case and nothing else.

MR. BRANCARD: Mr. Chairman and the Commission, very briefly, the Commission applied the standard in the Oil and Gas Act, Section 70-2-12B4, that requires prevention of drowning by water of any stratum capable of producing oil and gas in paying quantities and also to prevent any other kind of water encroachment that reduces or tends to reduce the total ultimate recovery of petroleum, oil and gas or both oil and gas that are in the pool.

In that regard, the evidence in this case as presented to the Commission today demonstrates that past production in the Delaware Formation and potential future production in this area requires the Commission to deny the application for Gossett SWD Well Number 1.

CHAIRPERSON CATANACH: Mr. Bruce, can we get a draft order in this case?

MR. BRUCE: I'll have it done next week.

CHAIRPERSON CATANACH: Thank you, sir.

MR. BRUCE: Within a week.

CHAIRPERSON CATANACH: Okay. Is there any other business we need to take care of?

(Case Number 15278 concludes, 12:58 p.m.)

STATE OF NEW MEXICO

COUNTY OF BERNALILLO

CERTIFICATE OF COURT REPORTER

I, MARY C. HANKINS, Certified Court Reporter, New Mexico Certified Court Reporter No. 20, and Registered Professional Reporter, do hereby certify that I reported the foregoing proceedings in stenographic shorthand and that the foregoing pages are a true and correct transcript of those proceedings that were reduced to printed form by me to the best of my ability.

I FURTHER CERTIFY that the Reporter's Record of the proceedings truly and accurately reflects the exhibits, if any, offered by the respective parties.

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.

MARY C. HANKINS, CCR, RPR
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