STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION COMMISSION

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

ORIGINAL

PROPOSED AMENDMENT OF 19.15.39 NMAC TO ADD TWO NEW SECTIONS SETTING OUT SPECIAL PROVISIONS FOR SANTA FE COUNTY AND THE GALISTEO BASIN; PROPOSED AMENDMENT 19.15.39.9 NMAC, AND PROPOSED AMENDMENT 19.15.39.10 NMAC.

CASE NO. 14255

REPORTER'S TRANSCRIPT OF PROCEEDINGS

COMMISSIONER HEARING

BEFORE: MARK E. FESMIRE, CHAIRMAN
JAMI BAILEY, COMMISSIONER
WILLIAM C. OLSON, COMMISSIONER

December 18, 2008

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Commission, MARK E. FESMIRE, Chairman, on Thursday, December 18, 2008, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South Saint Francis Drive, Room 102, Santa Fe, New Mexico.

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CHAIRMAN FESMIRE: Let's go back on the record. At this time, we will reconvene Case No. 14255, the Application of the New Mexico Oil Conservation Division Through the Environment Chief for Adoption of an Amendment 19.15.39 NMAC, adding new sections to be codified at 19.15.39.9 and 19.15.39.10 NMAC addressing special provisions for Santa Fe County and the Galisteo Basin, Santa Fe, Sandoval and San Miguel Counties.

The record should reflect that this is a continuation from the hearing that was last convened on Thursday, December 11th. The record should also reflect that Commissioners Bailey, Olson and Fesmire all present. There is, therefore, a quorum present of the Commission. And I believe at the end of the last day of the hearing, Mr. Brad Jones was under cross-examination, and Mr. Jones is not available today; is that correct, Ms. MacQuesten?

MS. MACQUESTEN: That's right.

CHAIRMAN FESMIRE: But you're prepared to continue with your next witness, Mr. Will Jones?

MS. MACQUESTEN: Yes.

CHAIRMAN FESMIRE: Okay. Ms. MacQuesten, proceed, please.

MS. MACQUESTEN: The OCD calls Will Jones.

CHAIRMAN FESMIRE: Mr. Jones, will you please raise your right hand and be sworn, please?

WILLIAM V. JONES

after having been first duly sworn under oath,

was questioned and testified as follows:

DIRECT EXAMINATION

BY MS. MACQUESTEN:

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

A. William V. Jones.

Q. And where are you employed?

A. New Mexico Oil Conservation Division, Santa Fe Office, Engineering Bureau.

Q. What is your title there?

A. Engineer, petroleum engineer.

Q. Could you describe your current job duties?

A. My current job duties are evaluating exceptions to administrative rules of the Division, and also I serve as a hearing officer and evaluate exceptions that are processed through hearing.

Q. What are your undergraduate degrees?

A. Geological engineering and a degree in civil engineering and an IT degree.

Q. Are you a registered professional petroleum engineer?

A. Yes.

Q. How long have you been?

A. For about 20 years now.

Q. Have you testified before the Oil Conservation Division in other cases?

A. I have.

Q. Were you accepted as an expert in petroleum engineering?

A. Yes.

MS. MACQUESTEN: I offer Mr. Jones as an expert in petroleum engineering.

CHAIRMAN FESMIRE: Any objections?

MR. HALL: No objections.

MS. FOSTER: No objections.

CHAIRMAN FESMIRE: Mr. Jones' credentials are so accepted.

Q. (By Ms. MacQuesten): Mr. Jones, what will your testimony be covering today?

A. Today I'll be talking about 39.9's portion that talks about the drilling and mud logging program that is part of the plan of exploration of development.

And on Section 10, I'm specifically going to talk about the logs to determine porosity and water saturation and the mud logging and the cementing casing and cementing and cement bond logs and also the change in requirements for the temporary abandonment status.

Q. Is it fair to say that you'll be addressing the downhole issues affected by the proposed change?

A. Yes, from the surface down.

Q. Did I ask you to prepare written testimony addressing the provisions that you just described?

A. You did.

Q. And is that testimony OCD Exhibit 3?

A. Yes.

Q. In your written testimony, do you address each provision one by one?

A. I do.

Q. I'd like to do something a little different for your verbal testimony today. Do you have a PowerPoint for us to illustrate the drilling process?

A. I do. We wanted to just briefly go over the drilling process primarily for those -- to show how we're going to -- the rules will be modified in the Galisteo Basin to ensure protection of potable waters and fresh waters and also just go over drilling the wells so we show how waters are protected and waste is prevented.

Q. Okay. Is that PowerPoint Exhibit 42?

A. It is.

Q. How was this PowerPoint created?

A. It was created with some freeware. I think Schlumberger had some freeware on their website, and we just used this to create this well bore diagram.

Q. Okay. I'd like you to use that PowerPoint to

walk us through the drilling process, particularly to address logging and cementing issues.

A. Okay.

Q. Let's start with the first slide that's up on the screen right now. Can you orient us? What is this showing us?

A. Okay. The first slide that you see on the screen is -- basically, all that's showing is -- the reason it's scrunched up in the top part is we wanted to have the whole well shown on the one 8 1/2-by-11 pseudo slide here. And the first slide shows the drilling of the surface hole to cover all potable water that exists in the well.

Q. Mr. Jones, if you could use the laser pointer, can you show us -- where is this surface on this slide?

A. Okay. The surface on all these slides is going to be at the top of anything that's shown on the slide.

Q. Okay. And this is a cross section?

A. This is -- yeah. It's a side view of the well as if you're sitting back away from the well.

Q. Okay. What depth are you trying to show with this?

A. Okay. This was modeled after the Black Ferrell No. 1, which is the only current producing well in the Galisteo Basin. And that's the reason we made this go down to 365 feet. This is drilling a 12 inch to 365 feet. The scale on here -- it's important to visualize the scale -- 12 inches is about

this big around. And 365 feet is longer than a football stadium. So the scale is grossly different on the X and Y coordinates here. But I just wanted to let everybody know that this is definitely -- this is the surface hole, and it's drilled longer than a football stadium in depth.

Q. Stadium?

A. A football field. Actually, a little bit longer than a football field.

CHAIRMAN FESMIRE: Mr. Jones, can I interrupt you just a second?

I need to point out that there are two hearings going on today. This one is the Oil Conservation Commission hearing. There's an Oil Conservation Division hearing occurring on the third floor. So if you're in the wrong place, you might want to go to the third floor.

I just need to make that clear. I'm sorry, Mr. Jones, continue please.

THE WITNESS: Okay. Well, this is the first slide, and all it shows is drilling the well. The shaped portions on the right just intend to show that this is just a hole in the ground is all it is.

Q. (By Ms. MacQuesten): Mr. Jones, you mentioned that in drilling this surface hole the goal was to cover potable water?

A. Yes.

Q. What if an operator doesn't know where the potable water is?

A. The operator works with the Oil Conservation Division to determine where to set the depth of the surface casing to cover all potable waters. And the OCD personnel and the operator work with the local water well drillers to try to determine as best they can where to stop drilling the surface hole.

The surface hole depth and the surface hole casing are the most critical portions of protecting the fresh water. This is not really any different than drilling a fresh water well, what we're talking about right now. So you saw from the State Engineer's testimony the numerous fresh water wells all over the Galisteo Basin. Well, this would be real similar to those, what we're talking about here.

Q. How are wells drilled? Could you describe the difference between --

A. Well, this would probably be drilled with rotary drilling methods. You could possibly drill the surface hole with air drilling, but it depends on how they get a contract for the rig and what's feasible as far as how much water you're going to hit.

Q. Could you describe the difference between air drilling and mud drilling?

A. Air drilling uses an impact hammer and

compressors that are used to drive the bit to pulverize the cuttings and blow them out of the hole in the annulus, and it typically makes a hole really fast. You can drill some areas of the country really fast with air drilling.

But the limitations are usually if you hit too much water or you start deviating or if you ever lose that air hammer in the hole, well, you've lost your hole totally. So it is pretty -- some people don't want to rig up the compressors or they expect to have too much water.

Q. And could you describe mud drilling?

A. The other way that's normally used to drill is rotary drilling, in which case that in the Galisteo Basin would be -- and in almost any portion of the Rocky Mountains would be -- a fresh water based mud drilling, which is basically a liquid that's thickened up with some thickeners to -- either bentonite or just using the velocity to pump down the center of the drill pipe with big hydraulic pumps. It goes out ports through the bit, and the bit is typically a tricone bit, and those cones turn on the bottom of the hole as you're turning to the right. The water shoots out the jets in the bottom through those cones, and it keeps the cones clean.

And it also provides velocity and viscosity to lift the cuttings to the surface on the backside between the drill pipe and the drill collars and the hole. And those cuttings go out into -- in the Galisteo Basin, they would go out into a

closed-loop of pits.

Q. Under the proposed rules, is there a mud logger on site during the drilling?

A. This is the proposed rules to have a mud logger from the surface on down to the total depth of this well.

Q. What does a mud logger do?

A. A mud logger keeps track of the drilling penetration rate. He typically -- he or she -- plots that up every day for the contractor that's drilling the well or the person that's paying for the well, or the Oil Conservation Division would look at the mud logs in this case.

But it's not just the drilling time. They keep track -- they write down the mud properties on the log itself. They describe the cuttings -- which typically you have a geologist or a geologist in training that does this. On air drilling, they can divert a little bit of the blow-by to grab some cuttings and not get sand blasted out of this and describe them.

And on rotary drilling, you just get samples, intermittent samples, and time the samples as the time that they're going to get from the bottom to the surface, so you know exactly where those samples were collected as far as depth goes, and plot the description of the samples on the log itself.

And also you have a hot wire or chromatograph --

actually, you try to measure the gas. You sense the gas and some of the hydrocarbons that are coming from the well, and you plot those on the log also. So you plot numerous things on the log. It's a real view of what's happening as you're drilling the well as opposed to an induced view that electric logs give you.

Q. What information do you get from that mud log? What is it used for?

A. It's -- for waste issues, what you use mud logs for, typically operators have mud loggers go on over the area that they're interested in so that they can -- they can look for hydrocarbon shows and also lithology to see if they're in the sands they're looking for.

Q. So typically do they mud log at this depth?

A. No, they don't, because they're not interested in this depth. All they're interested in this depth for is to protect fresh water. But they're not interested in hydrocarbons at this shallow depth. So they typically don't have a mud logger on site until later on in the drilling of the well, because the mud logger costs some money.

But as far as putting the mud logger on at this depth in the well, the value to that would be to plot the drill times and also plot the lithology as you -- as the mud logger actually sees it as you're drilling. So you can see the water sands, and they wouldn't see probably anything else. But they

would also put on there the mud properties used to drill the surface hole.

Q. You were present for the testimony of Mr. Morrison from the Office of the State Engineer?

A. Yes.

Q. And did you hear him describe the complex geology in the Galisteo Basin?

A. I did, and I've looked at that a little bit myself.

Q. How useful is it to have mud logging at the surface in an area where you may not know much about the water?

A. In a complex area, a lot of faulting and anticlines, inclines and formations that might be compressed, the mud loggers over more of the hole is typically used in wildcat type drilling like this where almost -- you move too far from a well and then you're going to -- in the Galisteo Basin -- you're going to be in a wildcat situation again.

So mud loggers would typically be used over more of the depth of the well in a wildcat situation, and the Galisteo Basin definitely is still a wildcat situation.

Q. Okay. Now, the rule also calls for logs showing porosity and water saturation.

A. Yes.

Q. Is that something that would be done at this stage, or could it be done?

A. Yes. This would be the default requirement for a well unless the operator obviously got an exception to that, if they could show reason for an exception.

But what that's in there for is to determine through -- to back up what the mud logger shows or the mud logger don't even see through induced measurement. Either natural or artificial radiation or resistivity of the formations, you can do porosity and water saturations.

Q. So is that also useful in detecting water?

A. Yes, it definitely is. Unfortunately, in most cases, when you drill an oil well, you get water -- or too much water over the zone of interest. I don't necessarily think in the Galisteo Basin they're going to get a lot of water, but it's possible. We want them to look for it.

Q. Now, do the rules specify when the logs for porosity and water saturation have to be made? Do they have to be made before the hole is cased or can they --

A. No. Because an issue in the surface hole typically is to get your casing in the hole as soon as possible. And the logs are continually evolving to be more diagnostic and more capable. And we recognize that you can log through casing in a lot of cases now and to actually determine porosity much more accurately than you used to. And for water saturation, you can actually look for -- it's less easy to look for that through a cased hole, but you can do that also.

Q. So although the rule doesn't specify cased hole or uncased hole logging, does the OCD have a preference?

A. The preference would be open hole logging, of course, because you don't have the casing and the cement to log through to get to the reservoir when you're trying to look at the reservoir properties.

Q. Okay. How much time would it take to drill to this depth?

A. It's real fast. Typically probably in one day they could get this drilled -- or less than a day -- drilled and completed; drilled, cased and completed. In Santa Fe County, there's an 18-hour wait time for cement. So it would be -- I'm sure you could get it done probably all in two days, even after waiting on cement.

Q. Okay. Let's get to the casing and cementing. Could we go to slide 2?

A. Okay, slide 2 just shows putting steel casing in the hole.

Q. What does the steel casing do?

A. Steel casing just provide a nice -- it provides competence for the well. Because what we showed in the last slide and what you can see also in this slide is the hole, and it's really not a smooth hole. It's going to be a lot of washouts and viscosity. That's the way it is when you drill a fresh water well or you drill the surface pipe of an oil well.

So what you do is you put -- in oil wells, unlike a lot of fresh water wells, you put steel casing in the surface pipe. So steel casing provides also support strength for your -- the rest of your -- the next hole that you drill out. And it also provides internal strength and external collapse strength. So first strength, collapse strength, strength for the shoe. Typically they call the shoe the bottom of the well -- the bottom of the casing is called the shoe.

But the shoe has to be strong enough to prevent anything that happens below that. And fortunately -- or unfortunately, I should say -- in New Mexico, most of the reservoirs are blown down and pressured so much that -- or they just don't have the natural pressure to -- if it wasn't for the protection of fresh water, you might not even have to have --

Q. Let's go to slide 3.

A. Slide 3 just shows the cement that's placed between the casing and the hole. The cement is impermeable to water, and it's basically just -- you can picture Portland cement that you use for your driveway but without the aggregate in it. And you've also -- you've got some other things in it. But it sets up pretty fast. It's pumped in a liquid form, or a pseudo-liquid form.

Q. Where is it pumped?

A. It's pumped down the top of the well. We need to keep remembering that this is a football field in length here

and 12 inches in width, so the slide you're looking at is not really representative of the scale of the well.

But they have a service company hook up -- or a cementing company hook up valves to the casing, which is this right here. And here's the casing. You hook up valves to the casing, and you pump the slurry of cement down, down all the way down the well, and it turns the corner when it hits the bottom of the hole, and it goes back up the annulus.

And when they see it on the surface or when they finish their amount of cement that they ordered out there, well, they quit pumping. Well, what they do is they put a wiper plug, like a plastic or ceramic wiper plug, after the cement, and they pump the cement down with water all the way to the bottom until the wiper plug hits the bottom shoe which has a little collar in it and that stops the wiper plug and that, and they hold pressure on the internal side.

Because the weight of the water on the inside is, you know, 8.3 pounds per gallon as water is, and the cement would be like twice that. So you have to hold pressure on it until the cement sets up.

Q. Now, the rules mention cement bond logs. What are those?

A. Cement bond logs are continuously evolving. The primitive ones came out many, many years ago, and they're typically used in the oil patch to look through the casing and

evaluate the cement to see if it's adhered to the casing -- first of all, to see what the top of the cement is. And also to see whether it adheres to the casing and it adheres to the open hole.

Nowadays cement bond logs are so much more advanced. They can -- it obviously depends on what you want to pay, like anything else, but you can evaluate the type of cement through them also.

Q. Why is it important to know whether the cement is circulated to the surface?

A. Well, again, the surface hole -- like drilling all those water wells in the Galisteo Basin -- you put the water at risk when you drill a hole through it. So these surface holes on oil wells are cased with steel casing, and they're cemented, rigorously cemented, and we want to verify that that cement is there in place for fresh water.

Q. Now, under the proposed rules, when are cement bond logs run?

A. They're run after every casing.

Q. Let's go to slide 4.

A. Okay. Slide 4 just shows drilling the next step of the hole down to -- in this depth -- 1800 feet, which is approximately the depth of what we call the intermediate hole, intermediate casing, will be set at that depth in the Black Ferrell No. 1. And in this case, it's 8 5/8-inch casing, so --

for instance, it's about this big in diameter. And 1800 feet is a -- you know, that's a long ways down there.

Q. Under the proposed rules would mud logs be run?

A. Yes, mud logs would be run. When they drill out to surface shoe, a mud logger would be on location, and they would record the cuttings, any shows, and describe the lithology and the drill time and have that available. Nowadays they have that available in electronic format, and it can be transmitted to the geologist for the engineer for the oil company typically in Houston or Tulsa or someplace so it can be transmitted anywhere. And the mud logger would be on location to describe everything all the way down to the bottom.

Q. And then if the operator was doing open hole logs with the porosity and saturation logs, they would be run at this time?

A. After you get to the total depth, then you pull -- and you got your hole in good shape -- well, you pull the drill pipe out and run the logs as soon as you can and make sure the hole is staying in shape.

Q. Move to slide 5, please?

A. Slide 5 just shows the drill -- instant intermediate steel casing that's put over -- all the way to the depth of well from the surface. Again, the surface is right here.

Q. Could we move to slide 6?

A. Slide 6 is a combination. It shows the cementing of the intermediate pipe at that time. Another cement bond log would be run, and it shows the drilling from the intermediate casing shoe all the way to what we assume, in this case, would be total depth of the well, and that's all it shows.

Q. Okay. And what would happen if the casing, the logs -- the mud logs and the saturation porosity logs -- detected water in this second stage? What would the operator have to do under the proposed rules?

A. Well, the proposed rules say that all fresh water has to be covered with the two strings of casing, steel casing, and cement.

The most important -- to protect fresh water, the first casing string and a good cement job is what you really need to protect fresh water from the external forces or the internal corrosion. We put in the requirement that another cement sheet or another casing string and cement be used in order to ensure that internal mechanical integrity -- in other words, the internal corrosion that might happen in future years if these wells are sitting there for 30 years. You would have another string, another factor of safety there to prevent internal corrosion.

And in practice, when you think about it, most waters -- even most fresh waters, most potable water and even most fresh water -- is closest to the surface, and you heard

that earlier in the State Engineer's testimony. And what happens is, in practice, you have two strings -- at least two strings of steel casing -- and at least one cement sheet across the fresh water.

Now, if you circulate cement on the intermediate casing, you would automatically cover -- you would have two cement sheets also across it. So in, practice, this is done pretty much already, but the reason we were even more careful in the wildcat areas like the Galisteo Basin, is -- and we wanted to make a special rule in this case to cover that -- to make sure if you did detect some fresh waters, waters that are protectable, less than 10,000 TDS, that they would be covered.

So what you would have to do is -- well, you're going to drill this well on down to total depth and run another casing string anyway -- so you have to keep that in mind -- but the requirement is to have two casing strings and two cement sheets across the fresh water.

Q. Let's move to the next slide.

A. The next slide just shows running your third string of casing all the way to the bottom of the hole. As you can see, if all your protectable waters -- and most importantly, your potable water -- is from 365 feet up, well then you've got three strings of steel casing that's protecting it from anything that happens down, in this case, 2870 feet.

Q. Let's move to the next slide.

A. This just shows the cementing of that final string of casing.

Q. Now, according to the proposed Section 10, does the cement have to be circulated to the surface on the smallest diameter casing string?

A. Yes -- no, no, not on the smallest diameter. On the smallest diameter, we have the requirement that we just talked about earlier. But that being said, if that requirement is already covered -- in other words, you're covering your fresh water with two strings of casing, two cement sheets, we just require them to bring cement up into the intermediate casing on the bottom.

We show, in this case, it going all the way to the surface because that's what most people will do, we found. But in order to prevent overpressuring of formation down here with a huge cement weight, you know, we wanted to ensure that all casing, all steel casing, is covered by cement to prevent external corrosion, and we've seen that that definitely needs to be done. And our current practice in the San Juan Basin, which is the closest analogous basin to this, is that pretty much to make sure that all casing stings are covered with cement.

But our rules don't require that. Our rules, as they're currently written for the whole State, don't require that cement be -- on the final string casing, it requires

cement 300 feet over the producing interval and, on the intermediate pipe, it requires it 500 feet over the bottom of the hole.

But our people in our district offices watch this constantly, and in practice -- our practice for many, many years has been admittedly in some cases a bit erratic, but in most cases, we have a geologist in our district offices that is experienced, and they watch this real closely.

And, obviously, if it's a BLM well, they have their people watching it, too.

Q. Let's go to slide 9.

A. Slide 9 just shows once you got your well drilled and your fresh water all protected, then you perforate your casing so that you can let the higher pressure formation fluids, hopefully some hydrocarbons, into the well so they can be in contact with low pressure in the internal portion of the well.

Q. We received a number of comments on fracing. Can you tell us what that is?

A. Well, just perforating that hole -- they use a shape charge to perforate through that steel casing, and it goes through the cement also -- at least that's what the service company will tell you -- but in actuality, you always have to open up those perforations.

Those perforations are 3/8 to 1/2 inch in diameter,

so they are little, tiny little holes in that pipe down at that depth. And then you got cement behind it, and then you got maybe some invasion -- a little bit of invasion of mud -- not much if you have a good mud program, but you might have a little bit. And you need to clean that up, and you need to open those perforations.

And that's why the oil companies always -- almost always -- in the United States have to open those perforations with some high pressure pumping of either some hydrochloric acid or some type of acid. And then they come in -- the acid gets spent and it dissipates, or they swab it back into a tank. And then you have to hook up -- in sandstones, you almost have to do hydraulic fracturing.

And what that's designed to do is just open up those perforations a little bit further out with an artificially-induced fracture that will be approximately a 1/4-inch at the maximum in width. So you're not talking about much of a fracture. But you try to pack that fracture with sand.

At this depth, you can use regular river sand to pack that -- especially close to the well itself you need it packed with sand -- and that sand has lots of porosity and permeability around it. So the higher pressures in the formation make their way through that high permeability fracture into the well, and it's opened up to the hydrocarbons.

Sometimes they use nitrogen with their fracturing. Fracturing has evolved over the years into extremely high technology. The Black Farrell No. 1 was fractured twice with energized fractures, which is nitrogen in the fracture. It cuts down on the volume of water that you need to pump by about two thirds, so you end up with a lot less water going into your formation and gel that has to carry that sand, so it's easier to clean up. The nitrogen provides some energy to bring back these low pressure formations. I'm sure they wish they would have gotten some here, but they obviously didn't.

Q. What happens to the fluids that are used in fracturing?

A. The gels are broken by temperature and formation. There's usually two types of breaker, the gels, that carry the sand that go into the frac job. They carry the sand in, and then they break. It's usually gar gum, the same stuff that's put in ice cream. It comes from India. But there is other additives, but they're a lot more minor than that.

But the gum or the gel is broken with temperature in the formation. Because as you can realize, that well is probably 110 degrees down there or more, depending on where you're drilling. If you're drilling close to an igneous place, it would be a lot more. But that would break the gel. And then there's some chemical breakers that you can put in there also in low temperature formations that you don't think that

you're gel is going to break.

So basically all the frac fluid is dissipated in the formation and the stuff that comes back is -- comes back with the flow of the natural flow of the well -- and it's routed into the frac tanks, in this case.

Q. So are the frac fluids left in the hole, or do they come out?

A. You hope they come out, if you've got a good well. But, obviously, a lot of them stay down there and just kind of dissipate.

Q. Those that do come out of the hole, what happens to those fluids?

A. They go -- our Pit Rule takes care of that. I'm not as -- your next witness can talk more about that. But they are not allowed to escape onto the ground so that they can possibly endanger anything. They're going to be going into steel tanks.

Q. If a closed-loop system is used?

A. If a closed-loop system is used. And that is proposed in this case. And the new Pit Rules have dramatically changed what probably people in the Galisteo Basin have seen in the past on drilling out there. It's not the same as what would happen as of the latest rule on controlling surface pits.

Q. If the Pit Rule survives?

A. If the Pit Rule survives.

Q. Can you turn to the next slide?

A. The next slide shows running steel casing down to the perforations. We obviously -- the Chairman of the Commission would catch me on this -- this steel casing has got to go all -- or the steel tubing has got to go below the perforations.

That's the first rule in production engineering is you put the tubing below the perforations so that you can break the gas out of the annulus, and it will let the liquids -- the water and the oil that comes in -- go up the tubing through the pumping system.

Q. Where does the oil go, and where does the gas go?

A. The oil and the water go up the tubing. The natural gas that you burn, most people burn in their fire -- that heats their food -- goes up the backside a bit.

Q. I'd like to ask you about some of the conditions imposed by proposed Section 10. First, the requirement that an operator run logs from the total depth to the surface that will determine porosity and water saturation. Do our current rules require this?

A. No. The current rules don't require logs at all. Obviously, most oil companies are not going to drill, in this case, probably a $2 million hole and not run electric logs or even mud logs over the bottom portion of it to determine the productivity of the well. But our rules do require electric

logs to be turned in to the Commission or the Division.

Q. So if they run electric logs, they have to turn them in, but there is no requirement that they run them at all?

A. No, there's no requirement.

Q. Why do the proposed rules require the operator to run logs from total depth to surface on porosity and water saturation?

A. That's to prevent waste of hydrocarbons that might be behind pipe. The geologists are not always as smart as they think they are, and there's sometimes things -- Glenn is going to get mad at me for saying this -- but sometimes there's things up the hole a little bit that could be produced that they didn't even anticipate. And if you don't run your electric logs over the upper portion of the hole, sometimes you miss that.

And the second reason, instead of just preventing waste of hydrocarbons, is to determine -- to back up what the mud logs showed -- and they used the mud log to fine-tune the interpretation of the electric logs -- but it's to -- the electric logs are run over the upper portion of the hole as a requirement in this case to look for potential high volume water sands that once in a while is discovered around the State at considerable depth and also to look for the water saturation in those sands.

Q. Another requirement in Section 10 is that the

operator have a mud logger on site from surface to total depth and that the operator submit mud logs and a written report daily. Do our current rules require this?

A. No, the current rules don't require mud logs at all.

Q. At any depth?

A. At any depth.

Q. Why do the proposed rules require it?

A. The proposed rules require mud logs from surface to TD to look for high porosity water-bearing sands and also to look for any hydrocarbon shows.

Q. Another requirement in the proposed Section 10 is that the operator isolate all fresh water zones and aquifers with at least two cemented casing strings. Do our current rules require this?

A. The current rules don't require cemented casing strings.

Q. What is the common practice, though?

A. The common practice is to have at least two strings of casing over potable waters and at least the outside of them has to be submitted. And that's what our current rules require.

Q. Why do the proposed rules require isolating all fresh water zones with at least two cemented casing strings?

A. Just to provide an extra level of -- I don't

know. To provide an extra level, a factor of safety, for internal corrosion as may have been experienced on the Black Ferrell No. 1.

Q. Okay. Another requirement is that the cement be circulated to the surface on all casing strings except for the smallest diameter. We talked about that earlier. Do our current rules require cement circulated to surface in this manner?

A. No, they don't.

Q. Why do the proposed rules require it?

A. We're trying to protect the casing from external corrosion. That's the -- because the casing is your primary defense for migration of fluids from one formation to another. And our rules -- if you'll look at our rules -- they do address that migration of fluids is prohibited. But it doesn't require cement to be put over about 300 feet over the producing interval of the production string or 500 feet over the bottom of the intermediate string.

But it does say that formation commingling of fluids through the backside of a well is to be prohibited, minimized. That's been recognized for many years.

Q. So the current rule states the goal to be achieved but they don't say how to meet that goal?

A. Yes. Our current rules, to their credit, are extremely flexible, and it allows for experienced regulators

and experienced oil companies and, you know -- oil companies that are looking out for the long term -- to take care of business.

Q. In the special rules that are proposed, the OCD is saying this is the default provision unless the operator can show another way of doing it?

A. Yes. And that would be shown -- yes, that's exactly it.

Q. Another requirement is that the operator run cement bond logs after each casing string is cemented. Do our current rules require this?

A. No. They require -- no, they don't. In practice, our districts require either a temperature survey or a cement bond log if cement is not circulated, but they don't -- it's not in our rules.

Q. Why do the proposed rules require it?

A. Well, in some cases you can have -- the proposed rules require cement bond logs to evaluate the cement competence and the top of the cement and top of the bond over the whole length of hole.

And for some reason, there's -- sometimes you have a slump back. When you cement a well, you'll have circulation at the surface, but you shut everything in and some high pressure faulted zone or some faulted zone that is high porosity permeability will suck that cement back down into it through

slumping. And you don't know that unless you run some kind of survey to see the top of cement.

And we require, in this case, cement bond logs so that we can actually identify where those zones have higher permeability and porosity are, because you can actually kind of see those on the bond logs. It's an inference also of higher porosity, higher permeability, because you can always see your bond is -- changes in the different types of lithology, so you -- it would also help identify possible fracture zones or even possible zones that could be amenable to yielding higher volumes of water.

Q. There's one condition in Section 10 that we haven't talked about yet, and it's in numbered paragraph 8. It has to do with putting a well on approved temporary abandonment status on a well that requires a gas pipeline connection.

A. Yes.

Q. In your written testimony, you asked to modify that condition. Can you tell us what modification you want and why?

A. Yes. The modification addition -- the reason we are asking the Commission to look at that and decide if they want to do that is our current rules require a demonstration of internal mechanical integrity before a well is temporarily abandoned. And there's several methods that our current rule allow to demonstrate this internal mechanical integrity, and

one of those is that the well can just be sitting there waiting on a pipeline, and it be drilled less than five years.

So that on the face of it, that might be okay, but what we found in the past is that sometimes wells are left that way for more than five years. And there's -- so we're just asking the Commission to not allow wells to be sitting without a cast-iron bridge plug or some kind of a plug over the perfs as a condition of temporary abandonment.

MS. MACQUESTEN: Is there another slide in the PowerPoint, Ms. Duran-Saenz?

THE WITNESS: That one just shows the oil and the water going up to the tubing into your sales lines. And you're -- it's intended to show the white, the natural gas, coming up the backside between the tubing and the casing.

Q. If you were to put in a cast-iron bridge plug, where would it be?

A. What you would do is pull your tubing out going with the wire line, set your cast-iron bridge plug and dump a little -- right above the perforations -- dump a little cement over it. And then you can go back with you're tubing in the hole and hang it right over the bridge plug and just leave it there.

But you circulate -- once you get the tubing in the bottom of the hole, you circulate your annulus with corrosion-inhibited fluid and just -- fluid, obviously, that

won't hurt your formation when it's released back into the formation after the well is put back on line. But --

Q. Why did you want to modify the proposed rule to specify the placement of a cast-iron bridge plug?

A. Because we discovered that the rule says that a well can be qualified for temporarily abandonment, depending on the district manager, the district geologist -- actually, it's not the district geologist who usually does this. It's another person in our districts -- but they have the leeway under our current rules of allowing wells to be considered to be temporarily abandoned for up to five years with just the tubing in the hole.

But there's still -- you would have the perforations open, and you would have your annulus and your tubing exposed to any kind of corrosive environment, like the Black Ferrell No. 1 looks like it might have been that way.

Q. Speaking about the Black Ferrell No. 1, did you prepare a well bore diagram of the Black Ferrell No. 1?

A. I did.

Q. And is that OCD Exhibit 41.

A. It's OCD Exhibit 41, yes. Obviously, this was not created with Schlumberger's free software. This was created to show basically everything I could find in our well files. The operators always have more detailed well files than we do.

But we get our regulatory information in our well files and anybody can go through them online and anybody can browse through the electric logs that are available. And I went through this well file and determined everything I could find, and I put it on one sheet of paper.

This well -- the most pertinent thing to what we were talking about here is when Tecton, or Tecton Energy, took over this well after many years, they had trouble getting the tubing out of the hole; they had trouble getting it back in. It turns out that they found that their casing had a lot of problems, probably internal corrosion problems. So that well had either been producing intermittently or been qualified for some sort of long term temporary abandonment for many years.

So what Tecton had to do is run another casing, internal casing string, inside the 4 1/2-inch casing. And as the Commission members all know, when you got 4 1/2-inch casing and you have to run an internal string of casing, you don't have a very big internal diameter to work with. So you end up with possibly losing your well or something.

But the bottom line is it looks like possibly internal corrosion occurred requiring another casing string. So that's why we're asking for the cast-iron bridge plug to be set over -- now, if the well is producing, obviously it's producing. But operators are responsible for their own wells.

But there's another thing to be seen from this

picture is the reports were real sporadic about whether cement was circulated or not. And sometimes -- it says it was circulated, like on the intermediate pipe, but years later they went and they opened up their Bradenhead valve between their surface pipe and their intermediate pipe, they found some fluids there. So it wasn't -- it looked like cement had slumped back to a certain extent there.

Q. Let me ask you this: If this well were drilled today under the proposed rules, would we be able to tell if cement had been circulated to surface?

A. You would, because you would have a cement bond log.

Q. But when you looked at the well file, there was no --

A. No, there wasn't. Our districts typically require all electric logs to be turned in. And in the San Juan Basin, people are turning in voluntarily mud logs and -- well, not all of them, but in a lot of cases -- well, it's not a wildcat basin for one reason. But they're turning in anything they do on the well, pretty much. So this cement bond log would have verified that cement was at the top.

Q. When you went through the well file for Black Ferrell No. 1, could you tell if the operator encountered fresh water in drilling the well?

A. No. The only inference of potential protectable

waters that I found was done from looking at the induction logs. If they did run logs all the way to 3700 feet in that well. Induction logs only went up to the intermediate pipe, but they were -- but from the intermediate on up, there was not much log there at all.

Q. If they had been required to run mud logs to the surface and had been required to provide porosity and water saturation logs, would we have had other information on whether water was encountered?

A. We would have had a lot more information about any potential high porosity, high yielding, protectable waters, yes.

Q. Does your written testimony, Exhibit No. 3, go into each of the provisions in more detail than your testimony today?

A. They did.

Q. Have you reviewed your written testimony?

A. Yes. Many times.

Q. Do you accept it today under oath?

A. Yes.

MS. MACQUESTEN: I move for the admission of Exhibit No. 3, Mr. Jones' written testimony.

MR. HALL: No objection.

MS. FOSTER: No objection.

CHAIRMAN FESMIRE: Mr. Jones' written testimony,

Exhibit No. 3, will be admitted into the record.

[Applicant's Exhibits 3 admitted into evidence.]

MS. MACQUESTEN: I also move for the admission of Exhibit 41, which is a hard copy of the PowerPoint presentation and Exhibit 41, the well bore diagram -- actually, I may have those reversed. I think 41 is the well bore diagram and 42 is the hard copy of the PowerPoint presentation.

CHAIRMAN FESMIRE: Any objection?

MR. HALL: No objection.

CHAIRMAN FESMIRE: Ms. Foster?

MS. FOSTER: No objection.

CHAIRMAN FESMIRE: Exhibits 41 and 42 will be admitted into the record.

[Applicant's Exhibits 41 & 42 admitted into evidence.]

MS. MACQUESTEN: I have no more questions of Mr. Jones.

CHAIRMAN FESMIRE: Mr. Hall?

CROSS-EXAMINATION

BY MR. HALL:

Q. Mr. Jones, if we could look at your Exhibit 3, your affidavit, we can work through that. The way your affidavit is structured, you're looking at the rule the way it is currently proposed, and you start by referring to Rule 7(B) and (C) about the second page of your affidavit, and we can

start there.

When you discuss Rule 7(C), you're looking at requiring operators to provide daily drilling reports; is that right? Which you typically see in the industry for daily drilling reports?

A. Daily mud logging reports? Drilling reports, yes. Air drilling -- let's see, in the 7(C)?

Q. Yes, sir.

A. Okay. Yeah, mud logging, daily mud logging reports, which hopefully will be drilling reports.

Q. Okay. You want to see drilling rates and information --

A. Yes.

Q. -- typically furnished by industry to inhouse engineers and co-venturers in drilling of a well?

A. Yes, yes.

Q. With the full suite of information that industry typically provides; is that right?

A. Yes.

Q. You also want to know about the mud parameters, mud weights, chlorides, funnel viscosities, filtrate properties, on a daily basis as well?

A. Yes.

Q. In addition to that, during the course of drilling and after drilling, you want the full suite of logs

that are performed on any well drilled in the area?

A. Porosity and water saturation determination logs, yes.

Q. You're not looking for the contents of frac fluids or any stimulative materials like that; is that correct?

A. In the reports, no.

Q. Okay. For the well logs in the daily drilling reports, you were involved in the industry for quite a few years, were you not?

A. Yes.

Q. And isn't it true that a lot of the information that's reflected in daily drilling reports and some of the logs, some of the interpretations of those data are proprietary and confidential?

A. Absolutely.

Q. Does the Division have a mechanism to protect any confidential data that it might require?

A. The Division has the ability to keep information confidential for a limited period of time. And they -- I'm -- that is getting over into the legal -- but as far as I'm aware, we always -- if the operator requests it, we will hold electric logs confidential for, I think, it's 90 days. But there is an issue with confidentiality, proprietary information.

Q. And can operators get extensions of the 90-day confidentiality provision for holding mud logs tight?

A. I don't think they can. And they're -- from what I've heard from our geologist, I don't think they can. It's just my -- that's been my experience.

Q. And the way the rule is currently structured in Part 7(B) and 7(C) of that, the requirements for the drilling program and the mud logging program as it is set out in the proposed rule now, those data must be provided as part of your E&D Plan?

A. Yes.

Q. That cannot be, can it? They don't exist at this point.

A. Yes, it doesn't exist. It's the plan of gathering the data that would need to be committed to in the plan of exploration and development, but not the data itself.

Q. So what would the operator need to submit to the Division so they could reach administrative completeness for that portion of their E&D Plan?

A. They would need to submit their plan as to how they're going to drill the well, what kind of method they're going to be using to drill it, whether it's air drilling or mud drilling or what -- whether it's going to be a fresh water mud or if some kind of another type of mud is needed, what would be the justification for that in 7(B). In 7(C), they would need to show their plan on how they're going to gather the data to prevent waste and detect fresh water through a mud logging

program.

Q. Okay. And so would it be reasonable to assume you also are looking for the operator to provide you with a commitment to provide you with the dailies and the well logs as they become available?

A. Yes.

Q. Would that be the way to do it?

A. Yes.

Q. If you look at the same page of your affidavit around line 75 through 77, what you suggest there is that operators provide the same detail of information that's provided to the BLM for their APDs on federal lands.

A. That was that Onshore Order 1, I believe it is. And the BLM's APDs, as you know, are extremely detailed. And they try to cover, you know, everything from archeology to surface issues to downhole issues.

But the ones I'm most familiar with looking at are the requirements that -- as you can see, in our well files, they're real numerous through the drilling through the Capitan Reef -- they require fresh water muds. And if an operator proposes -- and they look at that in detail to see where the top protectable limit is and where the bottom protectable limit is.

I like the federal program of more comprehensive regulation. But you have to realize that as a federal agency,

they own the minerals when this program is in effect. And I think that the Onshore Order provides in some instances for split estates. But it definitely looks at, you know, the cultural and archaeological issues.

Q. Could you explain to the Commission what is Onshore Order 1?

A. To tell you the truth, you're giving me more credit than I deserve here because I'm just available -- I know that it's supposed to be a pretty comprehensive order. Actually, I have a copy of it right here.

Q. Me, too.

A. It covers onshore oil and gas operations, federal and Indian oil and gas leases, approval of operations, basically. So you've got something that covers drilling and operations.

MR. HALL: May I approach the witness, Mr. Chairman?

CHAIRMAN FESMIRE: You can now.

MR. HALL: I don't have these marked, Mr. Chairman. This is a copy of the CFR promulgated which is referred to by BLM Forest Service and the industry Onshore Order 1. I think it's something the agency can take administrative notice of since it's been referred to.

It might be helpful for the Commission to have that.

CHAIRMAN FESMIRE: Mr. Hall, what's the source of this version? Is this --

MR. HALL: This is from the CFR.

CHAIRMAN FESMIRE: It's a direct printout?

MR. HALL: From the Westlaw.

CHAIRMAN FESMIRE: From the Westlaw?

MR. HALL: Right.

Q. (By Mr. Hall): If we look through the Division's well files for APDs that have been approved for BLM lands and Forest Service lands, as you say, anywhere in the San Juan Basin, which you say is the analogous basin to Santa Fe County, anyone can see what comprises an APD that is acceptable to both the Division and the Bureau of Land Management?

A. Yes.

Q. And do you envision operators in the Santa Fe County and the Galisteo Basin providing you with the same types and quality of data that are sufficient to support the Federal 3106 APDs?

A. I think it would be similar, and hopefully as -- obviously, the Oil Conservation Division doesn't -- we only have, as everyone knows, certain statutes that we're allowed to cover. I think one of the strengths of this proposed rule-making is it requires notice.

It requires a plan, and it requires notice. And, therefore, the other State agencies or private individuals would get notice and they would -- their statutory authority could come into play if they choose to do it at that time. So

they would get advance notice instead of seeing the rig drive up the road and that kind of a thing.

Q. Right. So in addition to the notice aspect of the rule proposed by the Division, generally what the Division would like to see, as I understand it -- and tell me if this is not accurate -- is a submittal which looks like what you give for Onshore Order No. 1?

A. That's a very comprehensive submittal, and I think it would be -- it would cover the -- all I can say for sure is it would cover the issues that I was asked to look at and testify to today. I better hold it to that.

Q. Okay. Is it also fair to say that the Division is just on a hunt for additional data here to help the Division determine the area extent of any fresh water supplies in Santa Fe County?

A. The data is obviously a fresh water issue. But it's the issue of gathering data, and it's a fine -- there's a fine line between what's -- you know, there's proprietary data. Obviously we're getting into a legal issue here.

But what I've seen, for instance, in the Williston Basin and in the development of a new play up there back in the '90s, is the sharing of data would dramatically help in some cases prevent waste of drilling unnecessary wells and possibly even hitting areas that would yield a lot more production.

So I have to go in favor of pushing the limits of the

legal limits on sharing data. If there's been 29 wells that I saw in Santa Fe County, and I look through the logs -- I looked through and tried to find the logs on those, and I would say five or six wells have logs, electric logs, that are on our system. They're not either -- I know they ran some logs, but they're just not turned in.

That's wasted money. Somebody -- obviously, it's not wasted money from the person or company that drilled it with the intent of developing -- protecting their correlative rights to develop what they had leases for. But then there's no -- I know the geologist here would back me up, but they wish more data had been gathered, you know, typically. It helps new people coming in to try to -- but, obviously, there's a legal issue with it.

Q. I've heard two numbers now about the number of oil and gas exploratory wells that have been drilled in the county. I've heard 32. You just said 29. Can you account for the difference?

A. I don't know the 32. I assume there's been a couple -- two or three in Sandoval County, a portion of the Galisteo Basin and maybe one in San Miguel County. But I just pulled Santa Fe County off our website that anybody sitting here can do, and it showed 29 wells.

Q. You sat through the testimony the other day of Mr. Morrison from the State Engineer's Office. And if you

could flip to his Exhibit 39, attached to that is his Figure 2, which shows the population of water wells drilled in Santa Fe County in the Galisteo Basin. The vintage of this data we understood was 1980; do you recall hearing that?

A. 1980 wells?

Q. The year 1980.

A. Okay. I don't remember that.

Q. Okay.

A. I do remember him showing this slide, though.

Q. You have said that the Division works with water well drillers to understand the location and vertical extent of fresh water throughout the county. Tell us what you do.

A. That is -- again, that's the most critical, in my mind, that surface -- the depth of your surface pipe is the most critical way to protect fresh waters.

I know what they do in the San Juan Basin. For a certain depth of well, they have a certain depth of surface pipe. But the San Juan Basin is much more defined and much more -- much more is known about the fresh waters there, although the tertiary members there frequently have fresh water, so you got to be real careful to cover the fresh water intervals.

But what, for instance, District 4 does, I know up in the Raton area, is the water -- they personally know the water well driller, and the water well drillers are the ones that

keep the records of how deep they drill the water wells.

The State Engineer probably has some of those records also, and I'm sure they have some requirements that the Commission, I'm sure, knows more about that than I do, because the Chairman used to work for the State Engineer.

But Mr. Morrison said that typically wells are drilled -- well, to paraphrase what he said, if I'm allowed to here, he said that people drill until they get enough water and then they typically stop. But he mentioned something about 500 feet in places. I saw one -- when I looked at a well log, it was around 500 feet. It looked like a fresh water zone. But I didn't see -- I didn't have enough logs to look at, really.

Q. Okay. Well, do you utilize the data from the WATERS database?

A. The WATERS database is used more and more, yes. And people that submit information to us use that database.

I work in a different bureau than the ones that -- our district offices are the ones that determine -- and typically it's the geologist in the district office, which it should be. The geologist is the one that should know about that -- is the one to determine where the surface pipe is to be set.

Q. All right. Do you know other types of data and from what sources that the Division's district offices are finding acceptable for these purposes now?

A. I know that if you -- I know in hindsight, after you drill a well and log it -- and if you have an induction log that goes up to your existing surface pipe and then you want to drill another well nearby, you can look at that, and that will tell you if you see a big resistive zone, hopefully not below your surface pipe. But if you did, that means you need to set your surface pipe deeper on the next well.

Q. Okay. What is -- focusing back on Santa Fe County now, what is the Division doing with all the data available to it from the State Engineer's Office and from the water well drillers to --

A. I don't know, I don't. As far as Santa Fe County?

Q. Yes.

A. There's only -- if I'm correct, there's only three proposed wells in Santa Fe County right now, and they've submitted a lot of information. I think Tecton has submitted a lot of information for those wells. But -- I say a lot.

I think they've submitted what they would need to do if it was going to be approved in the district office, but those wells are not approved yet. They're not signed off on by our district manager.

And indeed, I think those wells have been set -- currently they're ordered to be sent to an Examiner or a Commission hearing before they would be approved.

Q. Do you know if the Division is attempting to map the aerial extent of fresh water aquifers in Santa Fe County with the data that are available to it?

A. We haven't -- in the Engineering Bureau, we haven't jumped on that yet, but --

Q. It's not listed?

A. It's definitely, yeah. If people are going to drill wells, we definitely need to look at that. But again, I'm not the one that does that. But we do -- in the Engineering Bureau, we provide -- the Engineering and Geological Services Bureau -- we provide support to any of the districts as they ask us for.

Q. All right. You say that the data that you get from the water well drillers that the Division works with, are any of those data typically confidential?

A. I don't think so.

Q. Okay. Are the water well drillers subject to the same level of regulation that oil and gas well drillers are?

A. I would love to answer that question.

Q. Go ahead.

MS. MACQUESTEN: If he knows, Mr. Chairman.

CHAIRMAN FESMIRE: I think that's apparent in any question. Mr. Jones, if you don't know, you're not forced to answer. But if you do know the answer, please answer.

THE WITNESS: I better not. I would be making an

assumption that I shouldn't make.

Q. (By Mr. Hall): Do we know how water well drillers protect fresh water supplies when drilling through them?

A. If they drill with a cable tool while they're drilling through them?

Q. Yes.

A. While they're drilling through them, they typically drill with low pressure, basically. No -- if it's a cable tool, obviously, it would be zero pressure, but if it's rotary, they drill with fresh water, just fresh water, you know. Just drill with fresh water. If it's drilled to 500 feet, you'll to have drill with a rotary rig, probably.

So that would just be fresh water. I'm sure they don't pay for a mud company to come out and have a well-designed mud system.

Q. For the deeper water wells that are drilled into the older waters with potentially higher TDS values, is there any way to protect against those higher solids from commingling with the pressure supplies up hole?

A. I think you've hit on something that's -- well, the only way is to, after drilling, is to case it with, you know, typically PVC casing or whatever water well drillers do, and pour cement down the backside. So I'm not up on the water well drilling like I should be, but you've really hit on it

because I know they drill wells north of Santa Fe here that are 8- or 900 feet deep, and they're good fresh waters. But I'm not sure that there's any higher salinity waters that they're drilling down into that -- but protection of commingling of fluids is something that's been recognized by the OCD for years as not a good thing.

CHAIRMAN FESMIRE: Mr. Hall, would that be a good place to take a break?

MR. HALL: Yes.

CHAIRMAN FESMIRE: Why don't we take a ten-minute break. I want to inform folks that we're going to go to 11:30 today, then take a two-hour lunch break until 1:30 and then reconvene at 1:30 this afternoon.

But for the time being, we're going to take a ten-minute break and reconvene at 20 till 10:00.

[Recess taken from 9:30 a.m. to 9:45 a.m., and testimony continued as follows:]

CHAIRMAN FESMIRE: At this time, we will reconvene Case No. 14255. I believe the record should reflect that all three Commissioners are still present. We therefore still have a quorum.

Mr. Hall, you were in the middle of your cross-examination of Mr. Jones.

MR. HALL: Yes, sir.

Q. (By Mr. Hall): Mr. Jones, if you would look at

your affidavit on page 3. In discussing 10(B), the requirements for running logs, am I correct in assuming that an operator must run logs from TD to the bottom of the surface casing?

A. The actual surface casing, the surface hole, should be logged in some manner to determine the water saturation, whether it's an open hole or a cased hole. And then, of course, on the final logging suite, you could shut it off at the bottom of the surface casing in that respect.

Q. Okay. And when the -- were you finished? I'm sorry.

A. Yes.

Q. When you run your CBL, do you want the CBL run from the bottom of the surface casing to surface as well?

A. Yes.

Q. What does that get you?

A. That is the -- that tells you if there's been slump. It typically -- you know, of course, in a situation like the Capitan area, we have typical slumping. But -- and hopefully that wouldn't happen here -- but the very most important way to protect potable water is to have your hole drilled to the right depth, steel casing set to the depth and circulated with cement. And so we have seen slumped cement from surface.

Q. So you're interested in determining the integrity

of the cement job; is that right?

A. Yes.

Q. Rather than doing the science to determine the extent of the fresh water zones; is that accurate?

A. Yes, that's accurate.

Q. Okay. But you want all the e-logs so you can look at formation saturations and try to get a better picture of fresh water?

A. And also whether there's a big, thick high porosity down there that could yield big quantities of water.

Q. Okay. I understand you'd be looking at porosities and saturations. Is there really any practicable way for an operator to determine TDS or salinity while drilling?

A. Indirectly, if your mud properties change while you're drilling, you'll know that your formation fluids change in salinity one way or the other. But while drilling the mud log itself, it won't necessarily tell you if -- but it would show you if you have a big, thick, nice sand there. And it helps you interpret the electric logs more accurately also.

Q. Do you know if the same requirement will be placed on water well drillers?

A. No. I don't know if that would happen.

Q. Let's look at page 4 of your affidavit. The general requirement in your condition of approval of APDs is

that the operator should isolate all fresh water zones, and you say that is to protect fresh waters.

A. Yes.

Q. And by that -- by saying that, are you attempting to track the regulatory language in the Rule 7(W)(5) as a regulatory objective here?

A. I would have to get that out and read that again.

Q. I think that's an exhibit, actually. If you look at Exhibit 29 --

A. I'm sorry. Could you give it to me one more time?

Q. It's Exhibit 29 and we're looking at Rule 7(W)(5). It says the Division's objective is to prevent water pollution, and is this the operative regulation for that?

A. Actually, this would be one of them. But the -- I'm not sure of this one because it talks about -- yes. This would be one of them, but the other one would be the rule that requires no cross flow between formations. That would definitely be the one I was thinking about.

But definitely we're trying to prevent degrading the quality of the water due to oil and gas operations.

Q. You're referring to the rule for sealing off strata?

A. Sealing off strata.

Q. None of us know the rule numbers anymore.

A. No.

Q. Sorry about that.

CHAIRMAN FESMIRE: What's the old rule, Mr. Hall?

MR. HALL: Well --

CHAIRMAN FESMIRE: Apparently none of us know the old rules either.

MR. HALL: 106, closed.

THE WITNESS: I had it written down right here to tell you the truth, but I don't have it right now.

CHAIRMAN FESMIRE: 106 goes to 16.0.

MS. MACQUESTEN: Mr. Commissioner, you might also look at the Statute 70-2-12, which is Exhibit 34.

THE WITNESS: I would have to say that the sealing off strata rule is the one that I would -- that I would refer to.

Q. (By Mr. Hall): All right. I want to ask you a little bit more about what the Division's expectations are for E&D Plan submittals and your logging protocol. If an operator proposes an E&D Plan, and in the course of drilling through his e-logs finds that his target zone is not economic but identifies the bailout zone -- a surprise zone, some other interval -- is it your expectation that the operator would be required to submit a new E&D Plan? How would that work?

A. I think the E&D Plan that is originally submitted, if it's submitted with flexible enough terms, should

be able to cover bailout zones.

Q. Okay. And then -- what you envision for Rule 10 on temporary abandonment, you're looking for the placement of a bridge plug with cement on top of that?

A. I'm asking -- yes. Typically people put a little bit of cement over a cast-iron bridge plug, but it's easy to drill out when they want to. If it's ten years until they get a pipeline drilled or put into an area and they want to preserve their well for -- assuming their corporation is still in existence at that time -- but we would ask that the Commission consider changing the temporarily abandonment internal mechanical integrity condition to include this cast-iron bridge plug that can be drilled out in the future.

Q. Would you -- would an operator have to get a new closed-loop permit to drill out a bridge plug and cement like that?

A. I would have to defer that to, hopefully, Glenn. Glenn is coming after me, if you don't mind.

Q. One more engineering question, though. Wouldn't a retrievable bridge plug be sufficient?

A. The trouble with some retrievable plugs is if they're not drillable, then they're sitting there for many, many years. And you pay rental on them anyway, and you don't want to pay that for all those years. Even if you bought them and if they're not drillable, then you're in trouble and you

might lose the well.

But the language that the Commission could put in there would be a drillable plug, I would say.

Q. Okay. Mr. Jones, you participated in Case No. 13269 which led to the adoption of the current Rule 39, formally known as Rule 21 for Otero and Sierra Counties.

A. Yes, sir, I did.

Q. Can you tell if there is more or less geologic data available to us regarding Otero and Sierra Counties than there is for Santa Fe County?

A. I -- from what you've seen, there's not Otero County -- Otero County would need also a similar situation. If you don't have it on a special rule or special -- you can't have special pool rules, so you have a pool.

But special -- the special rules for Otero County that I participated in were just for injection wells. Because on injection wells, you're putting net pressure on your formation. And the concern of the EPA and the Division is for the migration of injected waste waters into any fresh, potential protectable waters. So that rule, as I remember, only covered saltwater disposal wells.

But on producing wells, you don't have any net increase of pressure in those wells, so you don't have the danger like you do -- you don't have the danger like you do to

saltwater disposal wells.

Q. Right. And isn't it fair to say that in the course of that rule-making proceeding on Otero County that the Commission was presented with substantially more geologic and hydrogeologic data and testimony than we've seen so far in this case?

A. I would say yes. My answer is yes on that.

Q. And also we learned a lot more about the forage, the grasslands, the soils?

A. Yes.

Q. And we don't have that in this case?

A. We don't.

Q. Do you know of any other Division witnesses proposed to address that?

A. I don't think they do.

Q. And Rule 39 addressed, as you say, really public hearings like what is proposed here encouraged -- well, mandated closed-loop drilling; is that right?

A. Yes.

Q. Abolishes the use of pits?

A. Yes, I think the pits are abolished. But closed-loop was -- I remember that part of it.

Q. All right. And then the remaining focus was, as you say, on the UIC protocol for injection of disposal wells?

A. Yes. And because Otero Mesa is primarily a BLM

province, and this is State and fee primarily.

Q. Well, there are State and fee lands within the boundaries of Rule 21, correct? 39?

A. There is some because it is a huge area.

Q. Okay. And was it the Division's view that it was unnecessary in that case to require the casing drilling and the E&D Plan protocols for Otero Mesa than what's being proposed here because the Statewide rules were adequate to protect fresh water supplies, human health and the environment?

A. That's a pertinent question, at least as far as a comparison goes between protection of different geologic basins.

But it's not -- our districts -- the plan of development that we have proposed here is to cover -- we're not primarily -- we're not BLM area here, and we were -- the BLM had numerous restrictions on the Otero Mesa as far as -- and they have environmental impact that they have to -- environmental assessments, environmental impact statements -- that have to cover an area that is being drilled on BLM acreage.

The Division controls saltwater disposal, even on BLM acreage. So we didn't -- no, we didn't include the plan of development. The short story is we didn't.

Q. Okay. So --

A. We didn't want to duplicate what they had done.

Q. In Otero Mesa, anyway, Statewide rules are sufficient on State fee lands?

A. Our district geologist has a lot of leeway in -- and we do have the rules about migration, preventing migration of fluids, and as long as we have a good district geologist that looks over those APDs, and if he or she is not comfortable with it, well, then, they can set it to a public hearing, and we could cover it that way.

But the level that is being proposed here as far as specificity of rules, wasn't covered there.

Q. Okay.

MR. HALL: I'll pass the witness, Mr. Chairman.

CHAIRMAN FESMIRE: Ms. Foster?

MS. FOSTER: Thank you.

CROSS-EXAMINATION

BY MS. FOSTER:

Q. First, Mr. Jones, I'd like to thank you for the education lesson that we received on drilling a well. It was extremely useful to me because I'm just a lawyer, and I'm not a petroleum engineer or a hydrologist. So that was very useful. Thank you. I also would like to thank you for your very short and direct answers to our questions.

So I just wanted to clarify some things where you ended up with Mr. Hall, talking about Otero Mesa. Is it your testimony, then, that if a county has a lot of BLM presence in

that land, then, you as a geologist would feel comfortable allowing the BLM rules to basically control that county's operations, and therefore you don't need to have a special rule for that county?

A. From my experience, the BLM rules are relatively adequate. I've talked to our districts up in San Juan, and they said that they look over the BLM requirements pretty closely also.

But, yes, I like the BLM's comprehensive overview of their regulation. As you know, the Oil Conservation Division just has, you know, waste, correlative rights and protection of human health and environment as part of their -- they don't have cultural and archaeology. But with this we have a notice that the cultural affairs people would -- they could take the ball and run with it if they wanted to.

Q. So the notice provision that you're concerned about is specifically to the Cultural Affairs Department?

A. That's the one I was thinking of. I'm pretty focused on what we do here. But, yes, I do like the BLM's requirements.

Q. Are you aware of any State rules that operators must adhere to concerning, you know, finding cultural resources or any notification that needs to be done to the SHPO prior to actually getting out on State trust lands?

MS. MACQUESTEN: Objection. This goes beyond the

scope of cross-examination. He did not testify on those issues.

CHAIRMAN FESMIRE: Sustained.

MS. FOSTER: Okay. Well, I'm a little confused, then. This rule does talk about cultural resources. I was just following up on his question -- his statement concerning cultural resources.

CHAIRMAN FESMIRE: But I think his expertise is in petroleum engineering and that's the function that he's testifying to.

MS. FOSTER: I understand that. But he is a hearing officer. I'm sure he's aware of whether notice needs to be made currently as to the cultural resources. That's really only the gist of my question.

CHAIRMAN FESMIRE: I sustained the objection.

MS. FOSTER: Okay.

Q. (By Ms. Foster): You talked about setting surface casing in the first part of your demonstration there. And you stated that surface casing is the same -- the process is the same as for setting a fresh water well as for drilling a fresh water well, right?

A. Very similar.

Q. Okay. Does the OCD require water well drillers to mud log their holes?

A. No. We don't look after water well drillers at

all. They're -- somebody else does that.

Q. Okay. All right. Then would you know what they would have to do with their drill cuttings as a result of drilling a hole?

A. Just from personal experience, they go out on the surface. That's what I hear.

Q. Okay. So they go out on the surface. And -- all right. Are you aware of any case of water contamination due to drilling water wells in the Santa Fe County area?

A. I'm not personally.

Q. All right -- do you know a way to determine water quality from mud logging, the program that you --

A. You can run -- put an O-meter in -- that's a good question. You can put an O-meter in the mud and look for resistivity of the mud. And actually, Glenn might be able to answer that specific question in a little more detail.

Q. Okay. I will ask him. Now, fresh water drilling, under the definitions that we're working under here with the OCD, fresh water is considered anything that is less than 10,000 TDS, correct?

A. Yes.

Q. All right. And I think Mr. Hall asked you this question, but I just want to follow up. If you are drilling a fresh water well or the first part of your casing, and the fresh water that you're using has a higher TDS than what you're

drilling into, is that not commingling?

A. That is. It is.

Q. And the reverse is also true? I believe Mr. Hall asked you that question.

A. Yes.

Q. And do you know if water wells would have cement casing and steel piping?

A. I think they're traditionally -- I mean, not traditionally, but the -- I think the latest -- just from my personal experience, I think they use PVC pipe, which is not as strong as steel pipe in water wells -- and gravel packing on the bottom or other some cement. But I should qualify my answer that I'm not as up on that as I probably should be.

Q. Okay. Looking at the map of the Galisteo Basin, I believe it's Exhibit 40, Figure 2. That's the map with the water wells.

Looking at the distribution of the water wells in this Galisteo Basin map, on the northeast corner, that is where El Dorado is located, correct?

A. Yes.

Q. Okay. And El Dorado is a relatively new community in Santa Fe County, correct?

A. Yes.

Q. Just for the record, it's Exhibit 39; Mr. Hall has corrected me. Exhibit 39, Figure 2 -- but we have the

right thing up here.

CHAIRMAN FESMIRE: That is Exhibit 40.

MS. FOSTER: Okay. But that's the one I want him to look at.

MR. HALL: Didn't you want this one?

Q. (By Ms. Foster): Concerning the El Dorado area, are you aware what type of septic systems they have up there?

A. I am not. I don't know. Some of our people that used to work in the Environment Department might be aware of that, but I'm not.

Q. But would it be a municipal sewage facility that covers that?

A. Those lots are pretty big, so probably -- I should say I don't know.

Q. Okay. All right. That's fine. Well, do you know for sewage and solid waste facilities, do you know if they use steel casing and cement on those?

A. Steel pipe? No, I don't. Because it could be -- in the old days, it was asbestos. So I don't know what's being used. This is a new community, so I don't know, to tell you the truth.

Q. Are you familiar with the Galisteo Basin Report that was submitted as Exhibit 20 in this case?

A. You know, I am -- I remember when this was still OCD -- what I remember about it is that OCD was the lead agency

and other agencies submitted data, and it was all compiled probably by the OCD. To tell you the truth, I haven't read it.

Q. Okay. All right. Then I won't ask you any questions. But concerning the population growth for the Galisteo Basin and Santa Fe County, are you aware of any projected population growths for this area?

A. I think it's pretty big -- it is.

Q. Big in terms of the amount of population?

A. At least for El Dorado and the Santa Fe general area, I think it's big population growth anticipated.

Q. Okay. Now, looking at your Exhibit 3, which is your testimony, let's talk about the mud logger questions. You stated in your testimony, I believe it is on line 92, that you would prefer to have -- that your mud logger would be a geologist.

A. Yes, normally.

Q. Normally? Would you be required minimum qualifications for that mud logger? I think you testified earlier it could be a geologist in training?

A. Yes. Those poor people, they have to sit out there on the most noisy area of the rig and, you know, it's a thankless job. It's basically noisy and hazardous sometimes. But I don't -- as far as -- I don't like to have so specific rules that they can't be more flexible to suit a situation.

So I don't think -- I think definitely somebody with

some geology training should be doing this. But they almost always are anyway, because the -- if you want to get -- it's kind of an interpretive log anyway, and you're paying partially for the interpretation so you want somebody that knows what they're doing.

Q. Right. But you're not going to require anything like a PE stamp or anything like that?

A. No.

Q. It just has to be somebody who has the title, on your location, of mud logger --

A. Yes.

Q. -- to submit those daily reports?

A. Yes.

Q. Now, in the submittal of the daily reports, those would go to your geologist on staff?

A. They would go to the district manager who is -- in District 4, is a geologist -- unless we hire a geologist to work underneath him. That would -- this Galisteo Basin is considered part of our District 4.

Q. Okay. And District 4 covers what area of the State?

A. It covers everything in the State except for Hidalgo County and the southeast and the northwest. It pretty much covers the northeast and the Las Vegas Basin, the Santa Fe Galisteo Basin and the Catron County area.

Q. Okay. Now, you stated in your testimony that in order to find a location to set your surface casing, that is a communication that occurs between the OCD geologist and the operator, right?

A. Yes, it is. But it's planned from the start because things happen so fast. But we're hoping with the addition of a mud logger on the surface pipe -- or surface hole -- that that can be -- the mud logger can say, well somebody -- sort of a pro can be there on location to decide where the surface pipe should be set and have some flexibility in it.

Q. Okay. So are you saying if there is a mud logger on location, then there does not need to be communication with the OCD in terms of where to set that surface?

A. No, there does, still.

Q. Okay. And then that leads me to my next question: Your mud logger is basically interpreting data, correct?

A. Yes.

Q. And the OCD geologist would be taking that data and interpreting it as well?

A. Yes. Sometimes they don't trust the mud loggers, and they'll go out there and look at their own samples.

Q. Okay. And what if they come up with different interpretations?

A. The OCD would be the regulating agency there. The person drilling the well is responsible for protecting that potable water, but the OCD would be the regulatory agency over that.

Q. Okay. And you said that the OCD would be in charge with protecting the potable water, but this specific special rule talks about the protection of fresh water.

A. That's a good point. But the reason I keep saying "potable water" is -- to follow up on what the State Engineer's witness said -- and to -- the potable water is the most important useable water that's not -- you don't require any cleaning up of it to drink, and it's available at a shallow depth that -- and that specifically needs to be protected.

And we want to protect that from any oil and gas drilling. And now, we are charged with protecting any waters less than 10,000 TDS, also. And we're going to do that, too.

Q. Okay. So your existing rules for the State concern protection of potable water, but this special rule concerns protection of fresh water?

A. No. The existing rules for the State say protect fresh water. We just want to make sure our rules are specific enough in addition to being flexible on setting that surface pipe to protect fresh water. But I want to always get back to the fact that we want to protect that potable water at all costs.

Q. Okay. Then wouldn't it be easier to change the existing rules concerning setting surface casing and protection of potable water to apply to the entire State instead of having a special rule for Santa Fe County for their water?

A. I like overall State rules, myself. That's my preference.

Q. Okay. Now, how much input do you see the OCD geologist having in terms of -- you stated that they normally have input on setting surface casing. Now what about the intermediary casing and ultimately perfing?

A. Not the intermediary casing except in instances where the logs show some fresh water, protectable water. Then the drilling plan would have to be -- everybody would have to work with each other to make sure that the well is going to have two strings of pipe over fresh water.

Q. Okay. Which you said is the industry norm?

A. The industry norm is to protect potable water.

Q. Okay. But the two surface strings, the casings, is something that -- sometimes even three casing is often used?

A. It's often used, yes.

Q. Okay. Now, I believe in your testimony you stated there was concern about operators may be missing zones and, therefore, causing waste?

A. Yes.

Q. Would that be the OCD geologist's call in terms

of where to perf?

A. No, no. That's the oil and gas drilling company that's paying for the drilling of that well; that's their call as to whether to spend the money to complete -- you know, perforate and complete any one individual zone.

Q. Okay. But if you, as the geologist, you have the e-log, you have the mud log, and you see not only fresh water zones, but you see actually hydrocarbons based on your interpretation of the analysis, is it possible that the OCD geologist would recommend completion of location whereas a business geologist might not?

A. Yes. But we don't have the right to tell anybody where to perforate. They're the ones spending the money, and they're drilling that well to get natural gas or oil and associated gas, so they're the ones that are going to be doing that.

Q. But would that not be causing waste if that location is not perforated, and therefore it's a violation of the Oil and Gas Act?

A. I believe this is a step -- requiring logs is a step in the right direction as far as the move to prevent waste because that particular oil company might not -- with the addition of those logs and the mud log over the upper portion of the hole, they might see something that they either want to perforate and exploit right now or later on. That company

might give it up to some other company.

But I believe -- I don't believe waste -- I believe in looking at it from the other direction.

Q. Okay. So leaving it in the ground would not be considered waste under the Oil and Gas Act because of an economic decision or whatever business decision a company might have?

A. Business decision, yes.

Q. Okay. All right. Now, you stated on line 113 concerning Rule 10 that the proposed rules for the Galisteo Basin are intended to be more specific in order to prevent waste and protect the environment. And you're obviously talking about Santa Fe County in this instance?

A. Santa Fe County, Galisteo Basin.

Q. Now, again wouldn't Statewide rules be preferable to have -- if your intention is to prevent waste and protect the environment, why is it that State rules are good for everywhere else, the other 32 counties in the State, and this particular county needs to have special rules?

A. I like the idea of a Statewide comprehensive plan. I'm not -- that would be a major undertaking, and it needs to be looked at. Definitely, when I went through -- what I'm charged with looking at on this, what I see that should be definitely looked at Statewide is our cementing coverage requirements. But when I talk to our districts, the practices

may have covered things, but -- no pun intended -- but the actual rule doesn't say that.

But then, if your practice is one thing and your rule is another, then it just depends on who's doing the regulating at the time. You might get some new person in there that might not have the same interpretation as the person before them if they don't have a rule. So the cement coverage requirements would be a good thing to consider over the rest of the State.

Requirements of logs -- you know, we're getting into just me personally, what I would think of for the rest of the State, but I think somebody made the decision to stop and just do this first here and then maybe see about the rest. And I have no idea who made that decision. Honestly, I don't.

Q. Okay. That's fine. You stated in your direct examination -- in fact, before I go to this next question:

In fact, Rule 14 does allow the Division to impose additional conditions on drilling, correct? If there is --

A. Yes.

Q. Okay. And so currently under current rules, the OCD staff whether it's the district office or here in Santa Fe, you do have discretion?

A. There's a lot of nice flexibility there. Basically, it says they fill out the form C-101 and C-102 and then whatever other rules or other conditions, and that's what it says.

Q. Right. So you could impose conditions very similar -- I think what you said, like with Federal Onshore Order No. 1 conditions, for example?

A. Which No. 1 condition?

Q. The Federal Onshore Order No. 1 condition?

A. We could go to a certain extent toward that, but it would depend on the legal statutory coverage that we would have.

Q. Right. And the OCD does not have jurisdiction over cultural resources like we talked about earlier?

A. They don't.

Q. Okay. Now, when a geologist makes a decision concerning a drilling program -- again, there's interpretation, correct?

A. Yes.

Q. And I believe that you stated that new technologies now render more available information and better information and, therefore, better interpretations?

A. Yes.

Q. Now, again, if you have a geologist making an interpretive decision with this Rule in place, would he not be in violation of the Oil and Gas Act if newer and better technology comes along?

A. The requirement to make operators run the most expensive possible logs out there that would give the most

information; you're getting into their business there a little bit, I think. Specifically considering the waste issue, other operators have the correlative rights to drill for their suspected oil and gas and spend their two or three million dollars a well out there.

But I think you could go -- I think that definitely, for instance, looking at 29 wells in Santa Fe County and most of those not even having logs turned in to the Division is something that needs to be tightened up, but I can't say that it would be a waste to require them to run fracture finders or something like that or hole cores on every well.

It would be additional cost and it might discourage them from drilling enough to where it could cause waste that way.

Q. Okay. And concerning the confidentiality issue, do you think that that would dissuade operators from drilling in Santa Fe County and therefore making all the information public?

A. That's a really good question. And they would have to take that into account. They would. In which case, the landman or -- would have to, you know, they could go to this, for instance, the State land office and try to tie up a lot of the acreage in the basin before they start drilling, for instance.

So you would have maybe a deeper pockets operator on

a bigger operator that would do the Santa Fe Basin. But it would require more up front -- confidentiality issues, I think.

Q. Right. So it would be more costly to have your mud logger on location full-time, and it would be more costly to do the EDP as well as the public comment and the hearing process -- you'd have to pay for lawyers, and it would be more costly to basically run your plan.

Now, let me ask you this: What happens if you propose a drilling plan and, like you said, the geologist tells you you have to do something different than what was originally planned. Is that considered an amendment to the EDP?

A. Any amendments would have to be covered through a hearing. But hopefully the plan that was proposed and finally accepted by all sides would be flexible enough to handle that situation.

Q. Okay. So obviously, the operator would try and have something flexible, but the OCD would want to set some parameters on the EDP, correct?

A. But you have to be careful about being too specific on something you can't see under until you start drilling, you know -- and especially Santa Fe County with all the complex geology. You really don't know what you're going to get until you drill.

Q. Okay. Now, you stated that the Santa Fe Basin is the closest analogous basin to the Galisteo Basin?

A. You know, I stated the San Juan Basin is closest to this basin. And what I meant there was you've got Rocky Mountain type rocks where you've got crustaceous dominated deposits, and you've got your Dakota and Mesaverde and maybe a little bit of tertiary, in this case, Galisteo formation.

But basically you have rocks that are not evaporites. And Glenn can answer that. But I do think that he will verify that the San Juan -- the rocks in the salinity in the waters would be most similar to the San Juan.

Q. Okay. And the San Juan is pretty well researched, right?

A. It's all tied up, except for over west -- I mean, east, mean obviously.

Q. Now, with the hundreds of water wells that are drilled in Santa Fe in the Galisteo Basin, specifically, and Santa Fe County generally, the OCD still feels that it doesn't have adequate information?

A. For the surface pipes, I think those water wells were drilled down until they got enough water to satisfy the need of whoever was drilling them. And I think that we need to search for the limits of that potable water and also the presence of fresh water also.

Q. Okay. But under the special rule, it's going to be the operators that's going be shouldering the cost of getting the information, correct?

A. You're correct.

Q. You mentioned the question of notice. Are you aware of the Surface Owners Protection Act that was passed here in the State?

A. A little bit. I understand there was an act passed, and as it worked its way through the legislature and the Governor's office, it was diluted to a certain extent. But that's all I know. I don't legally know what it finally ended up being.

Q. Okay. But do you know the substance of what that act is supposed to do in terms of owners and working interest surface owners?

A. I don't.

Q. You don't. Okay. Thank you.

MS. FOSTER: I have no more questions of this witness. Thank you.

CHAIRMAN FESMIRE: Commissioner Bailey?

EXAMINATION

BY COMMISSIONER BAILEY:

Q. You've sat through and prepared testimony on quite a few rule changes during your seven years with the OCD?

A. Yes, ma'am.

Q. And you've seen just how detailed and how much justification must go into changing rules and preparing information for those rules. I note that there are many rules

that are being changed for this special rule without much background or justification. Was any of your task for this to justify why these rules should be changed, such as the one for submitting C-103s or drilling reports or any logs or any of the other major Statewide rules that are being changed to justify any of this upheaval of State rules?

A. That's a good question. It is a big ripple in our evolution of the rules, and I was not specifically asked to do anything more than address those specific -- the two issues on the plan of development, the mud logging and the drilling program, and then, of course, those five issues on -- I think five issues on Section 10.

But the addition of the requirement of notice to cultural affairs, I don't -- I think that's -- and to State lands, and fee owners -- and to answer your question directly, the preparation was as far as the Engineering Bureau goes, we looked at some issues of downhole issues, and then we talked to other people around the State, other districts.

We looked at some of the available data. But that was specifically what we did. It is a big, you know -- rule changing requires lots of research to -- but we're before you today asking for you to consider this rule and the merits of the different portions of the rule.

Q. I notice that as an Examiner, you do hear cases for special pool rules.

A. Yes.

Q. And, in fact, just last month there was an order for a special pool rule in which you were the Examiner?

A. I don't remember exactly which one, but I could --

Q. Case No. 14160, Kerns Petroleum for Pool Creation and Discovery and Special Rules in Lea County.

A. Yes.

Q. Okay.

A. Yes, that's it. I remember that one.

Q. You remember that one?

A. Yes.

Q. It appeared as though the criteria for this type of case were for the applicant to simply present geologic and engineering evidence for justification for special pool rules.

A. Yes.

Q. Do you anticipate that that is all that will be required for development of the pool rules after five years under this proposed rule?

A. Yes. The pool rule would be confined to the pool and then Santa Fe County one mile outside of the pool boundary. And the pool boundary, as you know, would be defined by the spacing unit for each well that's completed -- that has already been completed in that pool. But it would apply to the pool as it grows or unless they wanted to limit it to that.

But the geology testimony, it depends on what aspect of pool rules they want to implement. But if they want to implement spacing -- different spacing requirements, which is real common -- that would be geological and engineering evidence, and land evidence -- no, not land evidence, really on that one, but just geologic and engineering evidence.

So it would depend on what was being proposed for the pool. But the pool would just cover the wells and one mile -- the spacing unit and one mile, except in Santa Fe. Santa Fe would be one mile around it.

Q. The discovery well for creation of this pool and the special pool rules was completed May 16th of 2008, and they applied in this case, and it was heard August 7th. That's June, July, August -- less than three months. What justification is there for an operator to have to wait five years?

MS. MACQUESTEN: Objection; that mischaracterizes what the rule states. Pool rules are separate from this rule, and this witness was not coming to testify about the structure of the rules. But I would direct the Commission to what this rule is saying.

It doesn't replace special pool rules. Special pool rules will happen as they do now. What this rule provides is that at some point, an operator under an Exploration and Development Plan may be able to show that protection can be

given under a special pool rule and move out of the Exploration and Development Plan into the special pool completely.

But pools will develop and go through the regular process as they normally would.

CHAIRMAN FESMIRE: Ms. MacQuesten, I think you can bring that out in redirect, and I'm not going to sustain an objection against one of the Commissioners.

MS. MACQUESTEN: It will be for another witness, then, because this witness was not intended to cover this issue.

COMMISSIONER BAILEY: Is there a witness that will cover this issue?

MS. MACQUESTEN: We'll have to go back to Brad Jones.

CHAIRMAN FESMIRE: He's got to come back anyhow.

Q. (By Commissioner Bailey): The daily reports from the mud logger, do they need to be sent in on a daily basis or are they gathered up and sent in on a weekly basis?

A. The rule proposed is a daily submittal.

Q. And the district geologist will be looking at that?

A. Yes.

Q. Is there only one person who will be looking at that?

A. If he needs help -- he or she needs help -- they could ask for other help in the Division, primarily probably

from the Engineering Bureau.

Q. And there are other qualified people to be backup? I mean, people get sick, and they take annual leave.

A. Yes. That's the State agency situation.

CHAIRMAN FESMIRE: Not in the OCD they don't.

THE WITNESS: Mark doesn't allow us to leave.

But Daniel Sanchez supervises our District 4 manager, who is also the geologist of District 4. We have a couple of geologists or more working in our Environmental Bureau. Glenn is one of them.

But, yes, we're asking for a daily submittal. It could be electronic. They're doing that a lot nowadays, electronic. And there's actually an electric -- mud logging is all forms nowadays. A lot of people use automatic mud logging now.

Q. Well, I'm just dealing with practicalities in my line of questioning for you.

A. That's -- you probably have -- you obviously have a good knowledge of -- it is true that people do go on vacation. For daily decisions, most critical, of course, is that surface pipe sitting depth, and there's not many wells drilled in District 4. If Daniel sees that his District 4 manager is going to be gone, then he obviously -- I assume he would make arrangements for that. But that's a good point.

Q. And along the lines of the practicalities of all

of this, that 365-foot surface casing for the Ferrell No. 1, that was just an example. You're not requiring 365 feet for every --

A. That's just an example. We just based that off of what was done in that specific case.

Q. Along the lines of practicalities, the intent of the proposed rule is to have a plan that could cover more than just one spacing unit. Looking at BLM Onshore Order No. 1, they also reference a drilling plan that can also cover more than one spacing unit, and it appears to be a generalized requirement for information.

But then it says that if changes need to be made based on previous drilling or other information that gets obtained, then differences from the plan are handled within the APD for drilling a well.

A. Uh-huh.

Q. But under this proposed rule, would these minor differences be considered amendments to the drilling plan?

A. I'm in favor of flexible plans. Just having a plan, I think, is a good thing. But having a flexible plan is also -- that some changes in APDs as conditions warrant could be made is a good thing.

I don't think -- the plan itself would have to go get approved through a hearing process, but the plan --

Q. So as far as you know for the requirements of an

application to ask for the location of proposed exploratory wells and related facilities, even when no one can know where this second well will be until they have the information from the first well.

A. The second well, yes. It definitely would be dependent on the information from the first well.

Q. Right.

A. Seismic or whatever.

Q. So the OCD has to be flexible.

A. Has to be flexible, and I believe in that, yes.

Q. Okay.

A. I believe the Commission should adopt any rule that would require the Division to be flexible in that respect.

Q. Okay.

COMMISSIONER BAILEY: That's all I have, and thank you for your kind words for mud loggers.

CHAIRMAN FESMIRE: Commissioner Olson?

EXAMINATION

BY COMMISSIONER OLSON:

Q. Yes. I just want to start with one issue that I was getting a little confused on. You started answering in response to Ms. Foster about potable water versus fresh water. Can you point to me anywhere in the rules or statutes where the OCD is limited to just protecting potable water?

A. No, I can't. I just -- I can't. I'm just saying

practically speaking the shallow, high volume water that's able to be drunk without running it through a reverse osmosis unit should be the number one priority. Now -- but no, there is -- you're exactly right. There is none. Fresh water is defined as less than 10,000 TDS.

Q. Isn't all the references in the rules to protection of fresh water, then, not potable water?

A. It is. That's a good point. That's entirely the case, yes.

Q. And is it your understanding of the rationale that it is the water that is readily treatable to be used as potable water supply?

A. I think that probably was the rationale for the definition of fresh water. Obviously, as a long time WQCC hearing examiner, you'd know more about that than I do, the background for it.

Q. Well, are you aware that treatment technologies have changed a lot these days as well for treating saline waters to make them potable waters?

A. I am. I know the Navy does some stuff in the Tularosa Basin, and I think a large portion of the world depends on that technology to progress.

Q. And in certain portions of the world like the Middle East, they are routinely treating sea water which is up around 25,000 TDS for use as potable water supplies, aren't

they?

A. Yes, I think they are.

Q. And the definition that we have for defining fresh waters as what's protectable as 10,000 milligrams/liter of total dissolved solids is an old determination from the State Engineer from the 1960s; isn't that correct?

A. It is. Well, I don't know about the State Engineer from the '60s, but I know that the EPA requires us to, under the underground injection control program, to protect anything less than 10,000, and there's been talk of raising that limit to a higher limit, but that's just talk.

Q. Were you here earlier when there was discussion about -- I think it's OCD Exhibit 37 -- about the letter from the State Engineer to the OCD about what is considered protectable fresh water?

A. I was not aware of this. I went through the other day, our memos that Florene keeps about State directors in the past that have made memos, and it wound up in the book that Florene Davidson keeps in her office. I didn't see this. But this is obviously from the State Engineer to the Director of the OCD, Dick Stamets, who was one of the leaders in the underground injection control program as implemented by the EPA in the late '70s and early '80s. He's still well respected by the EPA. I think he still lives in Santa Fe.

Q. I guess I'll direct you to OCD Exhibit 37, and it

refers to a memorandum dated April 10th, 1967. Are you aware that this was a determination that the State Engineer gave to the OCD back in the 1960s?

A. I'm not. I was not aware of this, no.

Q. That it's actually a reiteration of a prior determination?

A. It looks like it is. It was from '67. So obviously, the State Engineer -- not only for litigating water rights -- but they have been aware of the potential contamination of water for a long time.

Q. I guess back to what I was mentioning earlier, there is a rather -- from looking at this exhibit -- this essentially is a rather dated determination, isn't it?

A. It's definitely dated, considering there's the technologies of cleaning up water has probably progressed since then. So the 10,000 does look to be dated, but it's still our definition of fresh water.

Q. Well, I guess, though, based upon current technology, this number could possibly be revised upwards to the range of 25,000 today, couldn't it?

A. It could. I could, to answer your question directly. If I might comment?

Q. Uh-huh.

A. If you've got -- someday water well drillers will be able to afford to pass on the costs of drilling a two- or

three-million dollar well down to a deep depth and drilling horizontally until they get enough volume to produce enough of this water to clean up.

Now, along with the salinity of the water, the thick, porous water sands that can give up vast quantities of water is something that is in short supply all over the State. Maybe in the Capitan Reef you can get that out, in portions of the Capitan Reef and in some places up in the San Juan. But you have to -- someday, that will be economical and people are going to be paying a lot of money for water.

Q. Are you aware that Sandoval County has already drilled such types of wells which are well over 10,000 TDS to great depth using oil field rigs to use, and they've actually drilled these up along the Rio Puerco? And they plan on using these waters over 10,000 TDS as municipal water supplies after treatment?

A. I had just heard rumors of that. I know that the Rio Grande Rift contains deep porous sediments that are saturated with waters. But I just heard rumors of this. I didn't know specifically about it.

But you put a lot of people together, you can afford to drill water wells if the water is available.

Q. Okay. Thanks on that issue.

On another point, you were mentioning that -- it seemed to me that your recommendation on these well

construction requirements that you're testifying on, that for protection of fresh water, these really should apply on a Statewide basis. Did I understand your testimony correctly?

A. I think that it should be looked at, the cementing requirements on the Statewide basis, yes. I think a lot of the problems that we've had in the past that happened were before the cementing rules we have in place now. But I think the cementing rules we have in place now could be strengthened statewide, yes, I do. It would have to be through a committee looking at it.

Q. Well, I guess, do I understand, then, what the Division's proposing here is having a higher standard for the Galisteo Basin and, I guess, I understand Santa Fe County, because a lot of the unknown geology and water quality with depth because there hasn't been a lot of information on deep drilling?

A. That is -- I would say that's definitely part of the reason, yeah.

Q. I'm going to try to clarify a couple of things in the rule since you're the witness that is addressing a lot of well issues.

First, I'm looking at OCD Exhibit 22, which is the proposed rule with the modifications that the Division is making at this time. I guess I'll look at 19.15.39.9(B)(5) -- I guess it's now (H) where it's asking for information on all

existing oil and gas wells as part of the maps that are provided. Do you see that?

A. Okay. Yes --

Q. Shouldn't this include plugged and abandoned wells as well? Shouldn't there be some information besides just existing oil and gas wells? Shouldn't there be information on all wells that have been put in the area?

A. In my opinion, yes. This question should be asked of the next witness, also. But, yes, it should be including all wells, even if they're plugged and abandoned.

Q. And then going to 19.15.39.9(B)(7), I guess in (B) and (C) here you're mentioning that you have a drilling program, an air drilling program, and a mud program, and that's in 7(B). And when I look down at (7)(C), you're talking just about a mud logging program.

Are you considering the mud logging program covers both air drilling and the mud program? You have a distinction up above in (B) that you don't make down in (C). I'm just trying to make sure I understand what you're proposing?

A. The drilling -- oh. The operative phrase is a "drilling program." That could include whatever method they want to use to drill, whether it's air drilling or rotary, rotary mud drilling. We probably should have put in there rotary drilling with mud to be used as the end of that portion on (B).

Q. Right, but then on (C), I see it only talks about a mud logging program.

A. Yes.

Q. Wouldn't you also want to -- would you consider that same program to apply to air drilling, or should there be some clarification of that?

A. The mud logging -- they can do a certain part of a mud logging with air drilling. They can get -- what I'm defining as mud logging is actual drilling rate and also diverting a little bit of the air cuttings out to catch some samples also.

I understand that can be done, also. I've never been on a mud -- on an air drilling rig, but actually mud logged the hole. But I've talked to other geologist who have.

Q. Well, then maybe it should be just a logging program if it's air versus mud, or are you just considering --

A. I wanted the distinction between electric logging and mud logging, because mud logging -- we're talking about the actual visual sensors that log what they drill through. And e-logging is induced responses to certain electric or radioactive logs that you can, as you know, you can interpret them to determine sand bodies, for instance, if you're talking about fresh water.

Q. Right. But I think I'm just looking at is it mud logger -- if you had an air rig and you're using that, would

you essentially use a mud logger, then, and be calling this still a mud logging program even though it's being drilled with air?

A. Oh -- good point, yes. You would still call it mud logging, just to keep the confusion -- keep the confusion in the picture. You would call it mud logging. You don't want to make it clear here.

Q. I think you somewhat clarified that.

CHAIRMAN FESMIRE: Something like maybe clear as mud, right? That's mud logging.

THE WITNESS: Clear as mud.

Q. (By Commissioner Olson): And then I'll go back to other portion you testified on the requirements in 19.15.39.10. If you would look at (B)(8) where you were talking about the issues with the pipe gas pipeline connections.

And I think I saw in your written testimony as well as in what you were verbally talking about here today about use of -- it should be done with a bridge plug above any open perforations. I don't see that in this language that's proposed by the Division. So that was, I guess, an omission?

A. That was an omission. This is a post -- basically, the only post-change proposed after the rules were noticed, and it would only strengthen that just a little bit.

Q. And do I understand your testimony to say that

you seemed like you modified it a little bit to say that it's with a drillable bridge plug above any open perforations?

A. Yes. I would ask the Commission to put in drillable plug -- you know, I'm afraid of someone setting a non-drillable plug out there, and they go out of business and, well, it's there 20 years later, and somebody tries to re-enter it.

Q. And I guess there was the distinction in our prior special rule on Otero Mesa in 19.15.39.8 about certain provisions for produced water injection wells that I didn't see in this rule, such as performing mechanical integrity tests on an annual basis. Why was that not included?

A. Which didn't put that in -- that's a good point. We didn't specifically address the issue of saltwater disposal wells in the Galisteo Basin. The districts and the Engineering Bureau have -- or the OCD, basically -- has the right to -- or has the prerogative to require more frequent mechanical integrity tests of salt water disposal wells.

But you're right. That's a good point. We didn't specifically address saltwater disposal in the Galisteo Basin that I know about.

Q. Well, the rule for Otero Mesa, the special rule for Otero Mesa, was designed for protection of fresh waters as well, wasn't it?

A. Yes.

Q. So why wouldn't the same requirements apply here?

A. We didn't specifically have language in there for salt water disposal wells, but you're -- I think that would have to be obviously testified to that -- there would have to be some kind of proposal or notice. It would have to be included. I'm not sure if the Commission wants to by inference throw that in to this rule without some notice and chance for -- but saltwater disposal is one of the most -- we have, I think, good rules and good procedure to evaluate injection proposals.

The plan of development should cover disposal wells. Obviously, the Division, when they look at that, that will obviously be part of the plan of development, I would think, so --

Q. Well, I guess if we adopted a special rule for Otero Mesa, because there was special conditions that needed to be protected, and we're looking at a similar thing here, for consistency, shouldn't we look at similar requirements if we're looking at fresh water protection? Especially, where there's a lot of unknown information similar to what was done in Otero Mesa.

A. There is. Now, the issues -- the provisions we have in here for logging from surface, from top to bottom or actually from bottom to top, as you know, and mud logging, and also the additional string of casing and cementing to surface

is designed to delineate and protect any fresh waters. So we didn't have that in the Otero Mesa rule at all. We had some specifics addressing saltwater disposal, but you can't determine where to inject water if you don't know where the fresh water is that you're going to protect or you don't know the salinity of the water that you're putting back in the ground.

So I think our rule is strong in the instance that it does delineate and fresh waters less than 10,000 TDS so that saltwater disposal wells would not be approved into those fresh water zones. The EPA rules and the State rules prevent us from doing that.

Q. Right. But isn't there the possibility that there's deeper formations that could be used below an underground source of drinking water that can be used as injection zones?

A. Yes. You mean salt -- below that would be endangering fresh water zones?

Q. No. I'm talking about zones that could be used for injection below underground sources of drinking water.

A. Yes, definitely. That's what would be required. When we evaluate the injection permit, we would require that. We wouldn't let them go into fresh water zones.

Q. I understand that. I'm just thinking in the case where we did have -- this would allow potentially injection

into deeper zones below underground sources of drinking water, wouldn't it?

A. Yes.

Q. Similar to what would be done in Otero Mesa, correct?

A. Yes. Otero Mesa didn't have all the -- we didn't put in all the delineation issues or provisions, but the BLM, you know, approves the drilling permits there to a large extent.

Q. But the same thing could be occurring. You could have injection wells in the Galisteo Basin just as you could in Otero Mesa, correct?

A. You have to get rid of that water somewhere.

Q. All right. And isn't most of the produced water in New Mexico disposed of by injection wells?

A. And the EPA recognizes that underground injection of oil field waste water is the best way to get rid of it.

Q. And then the majority of the water -- I think I've seen figures before of over 95 or 99 percent of the produced water in New Mexico is disposed of through injection wells, right?

A. It's -- I thought it was 100 percent. But, you injection wells -- disposal wells meaning saltwater disposal -- injection meaning injection for waterflood purposes. We have about 4500 injection wells in New Mexico, and we have about 60

disposal wells in New Mexico.

Q. Right. But then what I'm getting at is that the majority -- virtually as you're saying, virtually all produced water goes to deep injection right before secondary recovery or for disposal.

A. They produce it out of that deep zone; they need to put it back into that deep zone or somewhere even deeper.

Q. So shouldn't there be consistency between the rules as applied to Otero Mesa and the Galisteo Basin if we're looking at the same issues of protection of fresh waters?

A. Definitely. I agree. There should be consistency.

Q. And I think I just got one more question. I think we've had some discussion before. I know Commissioner Bailey and I brought this up earlier about the information being provided to us here seems to be applying just to -- at least as presented by the Division -- it seems to be applying just to information about the Galisteo Basin. And the information you've looked at is related to Galisteo Basin, then, and not the entire Santa Fe County?

A. I looked at -- I scanned logs in all of Santa Fe County that I could find, and there's not very many, and I saw -- if we can put something back on the screen?

But I guess I should just stick to your question and not elaborate here. But yes, I think all of Santa Fe County --

but that's defined in the definition, Santa Fe County and all of Galisteo Basin or vice versa, but it's covering both, which means some of Sandoval County and some of San Miguel County.

Q. Well, I'll leave it at that. Thank you.

CHAIRMAN FESMIRE: In the vernacular of the time, it's my turn. But it's been our custom to take public comment immediately before lunch and immediately before we adjourn in the evening. I meant to get a little earlier start on this if we're going to break at 11:30, so I'm going to ask anybody who has a time constraint who wishes to make a public comment now would you please raise your hand? Okay.

We'll start back here in the back. We have two ways of doing this: You can either come up and make a sworn statement, in which case, the attorneys can cross-examine you or you can just make a statement for the record.

Ms. Brandt, I guess you're going first?

MS. BRANDT: My name is Betsy Siwula-Brandt. I'm a scientist. Commissioner -- all the Commissioners and Chairman Fesmire, I spent several months during the winter last year researching available data and studies to familiarize myself with the oil and gas situation in Santa Fe County. I did this as a concerned citizen who lives in the Galisteo Basin. I do have expansive past oil and gas experience. I spent 19 years as a geophysicist and exploration manager for Exxon, both in the States and abroad.

I grew up among the oil and gas fields in Roswell. I am second generation oil and gas. My father is a former geologist with Yates Petroleum. He spent his entire career working the Permian Basin. I left the industry about ten years ago, and now I'm doing something completely different. So I wouldn't have ever guessed that many years later I find myself at the State OCD office pulling up all the old well logs of the Galisteo Basin.

Having come from the industry, though, I have a strong desire and interest that if oil and gas exploration does occur in Santa Fe County, that it be done right. I do have a report that kind of summarizes the highlights of what I've uncovered that I would like to give you today.

I'm just going to reference some significant scientific reports and studies that have been done that I've referenced in this report. And today I'm only going to briefly highlight five things. But when you take those five things and you overlay them one over the other, it really does create a very compelling story for the Galisteo Basin.

Number one, Commissioners, we're talking about drilling in Anasazi lands dating back to 12,000 BC when the first Indians reached the Galisteo River. Archeologists' studies show that the Galisteo Basin contains the densest Anasazi archeological sites in the United States of America.

These sites don't go away whether the scientific

study was done in 2004 or 2008. It doesn't matter. The scientific study pattern is that each archeological study taken only finds an increased density of sites. As landowners, such as myself, we've been required to commission these studies before building. So we know the truth of this firsthand.

Number two: We're talking about drilling in a residential area where strict county codes exist limiting any commercial development. And that's why there's no road infrastructure in the Galisteo Basin. It just doesn't exist.

Number three: We're talking about drilling in an area where there is a confirmed endangered groundwater aquifer.

And number four: We're talking about drilling in an area where there is only unconventional oil and gas resources. I pulled those 29 oil and gas records from the OCD digital database, which, by the way, is a great database.

It's not like the San Juan Basin or the Permian Basin that also has conventional resources connected to it. In those basins, there's a bigger, juicier dinosaur that died than in Galisteo.

The Society of Petroleum Engineers defines unconventional reservoirs as those reservoirs that cannot be produced at economic flow rates or do not produce economic volumes of oil and gas without assistance from massive stimulation, treatments, or special recovery processes and special technologies because of very low recovery factor cutoff

for the kind of rocks they are. They're very tight.

To be clear, conventional reservoirs can be produced at economic volumes without massive stimulation treatment, special recovery processes and leading edge technology. All the wells drilling the Galisteo Basin in the '70s and '80s which are in the OCD digital database underwent fracing and stimulation. It's just an undisputed fact. And also Tecton verified that it's an unconventional resource.

There's a huge difference in recovery factors for oil and gas. Conventional gas reservoirs have about a 50 to 80 percent recovery factor, as you know. And gas recovery factors are a small fraction of this amount for unconventional. Many, many more wells and stimulation such as fracturing is required to recover anything.

Unconventional reservoirs are the toughest and the most expensive to recover with the highest economic and environment risk in the business.

And number five: We're talking about drilling in an area that is very structurally complex unlike the Permian Basin and the San Juan Basin. Yes, the rock ages are similar, Cretaceous, but the structural geology is very different. The Galisteo Basin has undergone two major tectonic events: The Cretaceous compression event followed by a later tertiary rifting event. It creates two major sets in intersecting faults from the cretaceous to the surface.

The San Juan Basin and the Permian Basin are simple in comparison. Geologically speaking, technical studies back this up. Bruce Black, formally of Black Oil, has drilled most of the wells in the Galisteo Basin. And he documents this very well in many technical articles that he has published regarding Santa Fe County saying, quote, "The Santa Fe Basin is much more complex than the adjacent simple down warped San Juan Basin," unquote.

The cross section published recently in The New Mexican -- I don't know if you saw it, but I do have it in the report -- basically illustrates the complex geology of the area. If you look at a four-mile area in this Cash Ranch area, you can count 13 significant faults that connect the Cretaceous reservoir back up to the surface where the faults outcrop. The source for the cross section is Bruce Black, who is the Tecton geologist. So unfortunately the county or OCD, they cannot access the seismic data that Tecton used to create the cross section, along with all the well logs, because it's been taken off the market.

However, we can verify the severe density of surface faulting through the New Mexico Institute of Mining and Technology in Socorro. They've recently completed a four-quad geologic compilation of the Galisteo Basin faulting which confirms the significant density of surface faults. These faults act as recharge zones for Galisteo Basin aquifers.

The esteemed structural geologist who submitted the report to the OCD as part of the Shoemaker Hydrology Report, quote, "The most striking geologic characteristic of the Galisteo Basin is the extent to which, on both a regional and local scale, the Galisteo Basin is fractured and faulted.

"Development should be prohibited in defined recharge areas. Principal recharge areas consist of major arroyos, basinward slopes of mountain fronts, as well as major fault zones."

All of the proposed Tecton wildcat locations -- there were eight wells at one time. Of course, all of these are on the market now to be sold -- were located or very near significant surface fault recharge zones as documented in the hydrology report by Mr. Shoemaker, who by the way, has done all the more recent hydrology reports in the Galisteo Bain area. His company has done the most recent ones.

But this can also be confirmed by looking at these quadrangle maps. The State-involved work that was done there was a collaboration between the New Mexico Institute of Mining and the USGS, with geologists undertaking a fair bit of recent remapping in the basin in the summer in July. So the maps date for those quads 1999 to 2008. These maps are open filed. They're free to the public.

To say that no scientific studies have been undertaken by the State is simply just not factual. The State

prioritizes their mapping in the watershed areas for the good of the public, the Rio Grande, the Galisteo Basin, included in that.

So if you just overlay these five factual ingredients -- and, of course, there's more sensitivities -- but just these five: archeological sites, residential area, endangered groundwater aquifer, unconventional risky resource and hydrogeologic complexity, well, if there ever was a recipe for best practice and state-of-the-art technology, and to protect the environment, it would be here in the Galisteo Basin.

So if you'll allow me to continue, based on these attributes, I have some recommendations.

CHAIRMAN FESMIRE: Ms. Brandt, are they in your report?

MS. BRANDT: No. I just have the technical studies in the report. Can I go quickly?

CHAIRMAN FESMIRE: Can you go quickly?

MS. BRANDT: I'll go quickly.

MS. FOSTER: I have to object to her testimony because this is really bordering on technical testimony. She should have followed the rules that everybody else had to follow in terms of filing six copies of it. I would like to see her report. I'm very curious about it, especially since she is referring to data that is much more up to date than even

what the OCD has presented in this hearing.

And if she has any recommendations, again, she should have followed the rules and made the recommendations at the time when we all had to propose our modifications to the rule. So either she's a technical witness and therefore subject to the cross-examination, or she's just a public citizen and therefore, she really can't make recommendations.

MS. BRANDT: I am a public citizen, and I'm only here as a public citizen who lives in the basin, and I'm very concerned about the issues.

MS. FOSTER: I'm just concerned about following the rules --

CHAIRMAN FESMIRE: Hang on, Ms. Brandt. I don't think the rules have any provision for limiting public comment on this. Is this a public comment?

MS. FOSTER: There is a limitation on public comment if it is technical testimony, and what I just heard now was technical testimony.

CHAIRMAN FESMIRE: Where is that?

MS. FOSTER: I'll put out the rule, if you like, sir.

CHAIRMAN FESMIRE: Go ahead and finish, Ms. Brandt.

MS. FOSTER: I would just like to note my objection on the record. This is the same objection that I --

CHAIRMAN FESMIRE: Ms. Foster.

MS. FOSTER: If I could please finish?

CHAIRMAN FESMIRE: No. Counsel reminded me that this is not testimony. It is not sworn. This is a public comment. We're very, very limited in the limitations that we can put on public comment. I've asked her to hurry. She's agreed to hurry. And we're going to finish taking public comment.

And, Ms. Foster, you were the one that reminded me that we had to take public comment.

MS. FOSTER: Yes. And there's a lot of other people in the room who would like to make public comment as well. I just --

CHAIRMAN FESMIRE: So let's finish with --

MS. FOSTER: -- like to have the opportunity to cross-examine this woman because she does have obvious very good information and technical testimony. This is the same objection that I made to Katherine Slick's testimony as well as the Game and Fish Department. All these people are coming in with valid testimony as to this rule that I think they should be cross-examined so we can question them for their basis.

CHAIRMAN FESMIRE: Again, this is not sworn testimony. These are personal opinions, public statements.

MS. FOSTER: Please note my objection.

CHAIRMAN FESMIRE: I'll note your objection.

MS. FOSTER: Thank you.

CHAIRMAN FESMIRE: It is not a valid objection. Ms. Brandt, please continue.

MS. BRANDT: Okay. Again, there could be no best practices in the Galisteo Basin without the special rules and required studies such as monitoring wells. There are three types of aquifer recharge areas that are in the Shoemaker Report, the third category, that will need additional field work of surveying, fracturing and faulting on the surface and the shallow subsurface.

I believe all potential aquifers should be mapped, including the deep aquifers, not only the known aquifers. There's been drinking waters, good drinking water, documented in the Dakota formation in this report where there's two wells at depths of 1500 feet and 2,000 feet. There's a growing understanding that deeper aquifers are both useful, and they could be threatened by oil and gas development.

Many of us are already drinking out of 1,000-foot wells. We're paying $40,000 for those wells. So we're all looking deeper for future drinking water for our communities.

Number three: Drilling and fracturing hard rock is very tricky. The cement failure can and it does occur. The tighter the rock, the tougher it is to get a clean fill. This was demonstrated just recently in Colorado in 2004.

A poorly drilled gas well and fractured reservoir very similar to the Galisteo Basin near Silt, Colorado, allowed millions of cubic feet of natural gas to escape a formation over 55 days. It travelled 4,000 feet through fractures in the

rock and exited into West Divide Creek. Testing revealed elevated levels of benzene, a cancer-causing chemical in the creek water. This incident has been well documented by the Rocky Mountain News. How did it happen? The well was supposed to be surrounded by cement from the bottom to the top, but the cement collapsed falling to a depth of about 4,000 feet. This failure allowed natural gas to seep into the well and drift upward, exited at about 1500 feet where it travelled through rock fractures to the creek.

The Colorado Oil and Gas Commission study found that the area's unusual geology -- again, very similar to the Galisteo Basin, unconventional fractured rocks -- could be easier for natural gas to enter neighboring wells caused by natural geologic wells caused by a natural geologic fault that intercepted the production area of the well. Many people did get sick.

So as you know, the Colorado Commission is imposing new cementing rules throughout. This is not "may happen," "might happen," it is happening. It is more difficult to get clean cement seals in tight, hard, fractured rocks. It's very proper that OCD's special rules should address special precautions related to cement jobs. Oil and gas operators don't want these kind of failure. These special rules protect them as well. I don't want to see Santa Fe County make the same mistakes that Colorado has with similar unconventional

fractured oil and gas plays.

And number four: I also submit that the language that be added to these special rules that would recognize that special setback requirements may be in order by operators designing permits depending on where their wells are located in their E&D Plans. I think the State needs to have that kind of flexibility in order to protect groundwater recharge areas in residential drilling.

And then number five: I do recommend RFDs: reasonable, foreseeable, development scenarios. I think that that's something you should collect before permitting is allowed. It's a full landscape study of the cumulative impacts of oil and gas development on natural and human environments. It's a planning tool that BLM has used for many years to assure that it understands the likely effects of full field development at the outset. And it does not base its planning on piecemeal decisions.

A comprehensive picture of the environmental and social disruption caused by full field development, the end product should be deeply understood. Our State regs need to catch up, in my opinion, to those of the federal regulations. Let's be smart and begin with the end in mind with plans that plan for accumulative impacts of future oil and gas development, especially in a residential area such as Santa Fe County.

I'm looking at the attorneys, and I'm hearing them talk about the one-size-fits-all approach to regulation in New Mexico; the oil and gas rules must be consistent, quote-unquote, across the State. I don't understand the argument. Oil and gas operator practices, themselves, are situational. They're not consistent. They can't treat drilling, conventional drilling, like unconventional drilling or they would never be successful. So the approach is different and so should the regulations be, depending on what you're drilling for.

The Galisteo Basin is unique. It's not consistent with other basins in New Mexico. Our State exploration and development rules must reflect the unique attributes of the basin.

I, in closing, believe the special rules you've created are straightforward and reasonable. I think they're fair. I think they're responsible, and they're responsible to both sides, not just one.

And I'll close just by saying fresh groundwater is our most precious resource. What I'm hearing that technical data or studies are not supporting these special rules makes -- it's just extremely inaccurate. The OCD database is extensive. Dr. Bruce Black's technical studies are all published. Recent New Mexico publications, even by the newspapers, the journals, hydrological reports have been published. Geologic reports,

New Mexico mining database -- Santa Fe County has an extensive database and maps. There's extensive analogs to this reservoir published by the Rocky Mountain News. I won't go on, but I really disagree with the arguments that have been made that there are not studies.

Thank you very much.

CHAIRMAN FESMIRE: Thank you, Ms. Brandt.

MS. FOSTER: Mr. Fesmire, if I may refer the Commission to Rule 1204, Subsection A(2), "Any person may offer exhibits in connection with their testimony so long as the exhibits are relevant and six copies are provided the Commission as well as all parties who have filed notice in the case."

CHAIRMAN FESMIRE: That's 1204 under the old system.

MS. FOSTER: 1204 under the old one, yeah.

CHAIRMAN FESMIRE: What's the new rule say?

MS. FOSTER: I don't have that new rule, except that I'm sure it hasn't changed because we haven't gone through a hearing on it.

CHAIRMAN FESMIRE: Read 1204 again. Does 1204 apply to rule-making?

MS. FOSTER: It applies to rule-making hearings and participation of nontechnical testimony.

CHAIRMAN FESMIRE: Nontechnical testimony. What about public comment?

MS. FOSTER: Well, this would be nontechnical testimony.

CHAIRMAN FESMIRE: That is testimony. This is public comment. Ma'am, why don't you come forward? We're going to go ahead.

MS. FOSTER: I would ask for a copy of the lady's exhibit, if she's going to be submitting that.

CHAIRMAN FESMIRE: You can ask her for anything she's inclined to give you.

MS. MURRAY: Thank you. This will be public comment. My name is Ann Murray, M-u-r-r-a-y. I live in the Village of Cerrillos. I'm a resident of the Galisteo Basin, and I'm the vice president of the Cerrillos Water Association.

I'm here in support of the proposed regulation. The water sources for our village come from the San Marco Springs and the Galisteo River, both of which can be impacted if strict regulation is not enforced. Thank you for protecting villages like Cerrillos with our 300 souls. I think we have all recently learned the importance of regulation where money and power are concerned.

What we are witnessing in this effort is good government doing the job of governing. In the long run, regulation protects the industries they regulate by setting reasonable limits that protect us all.

Thank you.

CHAIRMAN FESMIRE: Thank you very much, ma'am. There was someone else that couldn't make it this afternoon? Ms. Spear?

MS. SPEAR: My name is Linda Spear. I'm a lifelong resident of Santa Fe County. I'm a homemaker and a documentary photographer. I've been involved as a community activist on issues affecting Santa Fe County. My main concern is water. I've been producing a photo project on the Galisteo Basin during this past year during the time of moratoria.

I'm mainly concerned with the hydraulic fracing chemicals. These undisclosed proprietary mixtures that are proven toxins to water sources, primarily, as well as the air.

Over this past year -- and this is for the Commissioners -- I'd like to show us our water of northern New Mexico. These are the principle waters of Albuquerque and Santa Fe, of Heron Lake and the Heron Lake Marina and connecting in between them comes the Chama River. And this is a small State park along the Chama River -- above the Chama River canyon going down into the El Vado Reservoir. This is also osprey habitat. The osprey feed on fish.

Heron Lake -- it doesn't look so much in the photograph -- but the waters are very blue and clean. And of course, the Chama River runs through the eastern side of Rio Arriba County and we believe that this whole groundwater recharge area, the Chama River being part of the Rio Grande

rift valley, and our drinking water needs to have very good protections on the quality of our potable water. This is in the Galisteo Basin proper.

Speaking of the archeological resources, this is part of the fine art project that over 50 renowned documentary and high art photographers that are participating in from New Mexico. And this is from Petroglyph Hill, which is in the center of the basin. It's a most sacred site. It's a fault outcropping covered with petroglyphs. And this view from Petroglyph Hill shows a few of the petroglyphs here in front and shows the Ortiz Mountains in the back.

And you can see the Galisteo River itself as it meanders through the basin. It originates in Glorieta in the Pecos Wilderness and enters the Rio Grande at Santo Domingo Pueblo. It runs 55 miles. It is the groundwater sponge and resource for all our pure water that we drink in our water wells.

I recently had the water in my water well tested, and I tested for arsenic and solids, and it's clean water. It doesn't take any energy or distilleries or equipment to clean it and to drink it. It's a great privilege. It's given by God to have clean, fresh water to drink, and it's our commonwealth, and it needs to be protected. And I thank the Commissioners and OCD for protecting and making these special rules for this basin.

Anyway, this other photo is -- I was standing on the western bank of the Rio Grande at Santa Domingo Pueblo. A tribal elder took me there. And the Galisteo River enters in two mouths into the Rio Grande. And so this river that runs dry for most of it, it dives underground into the red sandstones underneath it. It does enter through springs on the Santo Domingo Pueblo along the riverbed and feeds into the Rio Grande.

And this is 90 miles south of where Heron and San Juan Chama waters and El Vado waters are stored. And 96,000 acre feet a year are released from Heron and El Vado reservoirs for the cities of Santa Fe and Albuquerque.

Lastly, I went to Sandia Crest, which is also a State park, and I did a panorama at quarter to seven on September 25th of this year. This shows -- and you have to look closely -- but it shows the interconnectedness of the basin and these deep geologic rock formations that surround us.

And here we're looking to the north and underneath I wrote, that you could barely see -- there were some forest fires in the Jemez, and it was very smoky, but you can see the vague outline of Tatilla Peak that sits on top of La Barraja Mesa overlooking the basin proper, and the Cerrillos Hills are in the distance. And of course, the Galisteo River is up in the Santa Fe National Forest and meandering between the Ortiz and the Cerrillos Hills and by all those traditional villages

that are located on it.

But I marked the Ortiz Mountains, the San Pedro Mountains and going on to the end of the rift on this side of Albuquerque are the Manzano Mountains. But behind them, if you look closely, you can see on the flat plain where the Galisteo Basin is intertwining -- and I don't know if I'm technically correct with the names -- I call it the Estancia Basin. It runs behind it. I've seen some of the New Mexico Institute maps. And ultimately it's connecting with the Albuquerque Basin. Now, we've hear that Tecton and the Atrisco Land Grant have like 200,000 acres leased for drilling on the west mesa of Albuquerque.

The Rio Grande Rift Valley, the Chama River, northern New Mexico, this is our water; for us and for future generations.

And I'd just like to read something from Texas. There's a reason that hydraulic fracing chemicals have been exempted from federal oversight. They've been exempted from the Safe Drinking Water Act, the Clean Water Act, the Clear Air Act, the National Environmental Policy Act, the Toxic Release Inventory Under Emergency Planning and Community Right to Know Act, and that's what I really take issue with.

I don't want to see anybody go out of business. Everyone has a right to make a living. But in Texas, you know, Betsy commented on the situation in Colorado. And I have a

very brief thing from -- and I have the link here that I can give you -- from gas drilling in north Texas, the Barnett Shell Range has been a worry for years, especially for homeowners, ranchers and farmers who depend on well water.

Fracing involves forcing high pressure water and chemicals into underground rock formations to fracture it and free up gas trapped in it. We believe, the residents of Santa Fe County, that this is primarily a gas play.

When the drilling starts, residents in many cases have found their well waters going dry, some temporarily, some permanently. In other places, the wells have come up full of mud, the water brown, sudsy and foul-smelling. But the deeper fears are what would happen if drilling somehow contaminated the aquifers, the underground that the entire region depends on and we depend on.

The Anasazi left this area centuries ago for a reason. They ran out of water. They ran into a tremendous drought period. But what happens if our water is contaminated? How do you remediate an aquifer? We don't have a big reservoir under us. We have pockets of fresh and potable water trapped in these sediments.

Until now, continuing with Texas, gas companies have pooh-poohed the fear, claiming their wells are dug at much deeper levels than the Trinity and Woodbine aquifers which provide commercial, industrial and livestock water for much of

Metroplex in northern Texas.

But the nightmare has become a reality for Beatles and his neighbors. They have no water. And in rural Texas, if you don't have water, you ain't got nothing. The presence of toluene in the water was a red flag that something was terribly wrong underground. And in the four months since the first tests were done on water from his wells, levels of the deadly chemicals haven't dropped, meaning, hydrologists say, that the solvent, which never occurs naturally in fresh water, is continuing to enter the aquifer.

We have a common gift that belongs to people in the oil and gas industry and to the people who live here. And we got to make it right for us all. But without water, we're all going to be moving. And thank you for your special rules and for considering this area that needs to be protected.

CHAIRMAN FESMIRE: Thank you, ma'am. You were wanting to make a statement?

MS. HATTAN: Thank you, Chairman and Commissioners. My name is Mary Ann Hattan, and I own land and have a business at 29 High Feather Ranch near the Village of Cerrillos. It's a bed and breakfast. And I'd like to thank you for the work you're doing to protect us by instituting these up-to-date regulations.

I believe the public has a right to be protected from any industry practices, including oil and gas, that damage our

environment. And government has an obligation to provide these protections. And yes, oil and gas would say that technology has changed, but that cuts both ways. Oil and gas must be regulated to be in step with current knowledge of the negative environmental impacts of open waste pits and the use of fracing chemicals.

Thank you.

CHAIRMAN FESMIRE: Thank you, ma'am. Is there anybody else who won't be able to make it here this afternoon?

Ms. Brandt, after looking at the rules -- are you still back there? After looking at the rules, it appears that you can make the statement that you need to make, but that we can't take the exhibits. So the record should reflect that no exhibits were presented with unsworn testimony today. Okay?

Is there anybody else who needs to or would like to make a statement today before we break for lunch and who is not going to be around this afternoon?

Okay. With that, we will break for lunch and reconvene at 1:30.

[Noon recess was taken from 11:45 a.m. to 1:33 p.m.]

CHAIRMAN FESMIRE: Okay. Let's go back on the record. This is a continuation of Case No. 14255. The record should also reflect that Commissioners Bailey and Olson and Fesmire are present. We therefore have a quorum.

We were in the middle of the Commissioner's

examination of Will Jones, and I think it was my turn, and I will proceed.

EXAMINATION

BY CHAIRMAN FESMIRE:

Q. Mr. Jones, could you put back up Exhibit 41, please? Now, you were using the Black Ferrell No. 1 as an example; is that correct?

A. That's correct.

Q. And if my memory serves me correctly, your surface casing is set at 365 feet.

A. Yes.

Q. Now, Tecton has proposed another well to be drilled from that pad, and they proposed a considerably longer surface string. Do you know anything about that?

A. That's a good question. I don't know exactly why because I did look at the logs on this well. And I assume -- and I couldn't tell if there was anything right below that surface pipe, but I would only be making an assumption that they were just trying to be extra careful or our district manager made them be extra careful.

Q. Could it be that there's now an indication that there's protectable water below that 365 feet?

A. It's possible.

Q. But you don't know for sure?

A. I don't know for sure.

Q. Okay. Now, the surface is never drilled with the salt in mind, is it, the surface hole?

A. No, not -- no.

Q. And it's your testimony that more often that not it's drilled with air; is that correct?

A. It's not necessarily. It could be -- sometimes they get a different rig in there to drill a surface hole and move it off and drill the rest of the hole with a bigger rig. Sometimes it depends on the contracts that the companies come up with on their drilling.

And, to answer your question, I don't know exactly how they would drill that surface hole, whether it was air or with a cable tool or a rotary drill.

Q. But if they had a mud logger on location, they would be able to tell for sure where they would need to set that surface casing, wouldn't they?

A. They would be able to tell where they encountered the lithology that would possibly be containing the fresh waters. And then somebody's got to make the decision that this is it. This is it, and you've got to stop and set the pipe. But once you drill out, then you know if you've -- and log, you know if you've made the wrong decision or not.

Q. And another thing that the mud logger would be looking for is a competent place to set that shoe for that casing; is that correct?

A. That's exactly right. They want a good solid rock to set the shoe in so they get a good cement job.

Q. Okay. Would you elaborate a little on that?

A. Well, for instance, if it was in the -- of course, this is at least a sandstone-type basin at least for the surface rocks, but -- I mean, for the -- I'm not so sure once you get down past the Jurassic whether it turns into a kind of a limestone or an evaporite basin or not because it seemed that way on the logs.

But you always want to set your shoe in a competent rock where you get a good cement job, because the cement has to turn the corner and go back up. Now, you can always use a stage tool or something like that.

Q. On the surface string?

A. On the surface string, like over on the eastern side of the State, they always set the -- you know, hit it into the Jurassic red beds. So that gets below those water sands that are highly permeable.

Q. So in a complicated geology like a Galisteo Basin, one of the reasons to have a mud logger there is to make sure you get below the water sands. Another reason is to have to make sure that you have a competent place to set your casing in?

A. That's what I didn't point out earlier.

Q. Okay. Okay. Now, you mentioned there was an

18-hour wait time on the surface casing, by our rules; is that correct?

A. That's correct. Except some counties in the State have less, but Santa Fe doesn't fall into those counties that can allow less than that.

Q. And one of the reasons is to make sure that the cement doesn't U-tube back on you; is that correct?

A. Yes. You hold pressure on it and let it set up, and you see what happens. And it's still out hardening time, compressive strength to build to where you've got enough -- you don't want to be moving that surface pipe when you drill out.

Q. And there's another significant reason to maintain that pressure, isn't there? Don't you want to keep that pressure on the casing so you don't create a micro-annulus?

A. Yes. Yes. You start moving that cement, you've got micro-annuluses. You let the cement move without maintaining the pressure, and you've got some possible micro-annuluses in spots.

Q. Or if you take the pressure off and you allow the casing to contract, it can create a micro-annulus; is that correct?

A. That's correct.

Q. So there are several reasons to keep pressure on there until the cement sets up, right?

A. There's several reasons for the long wait time. There certainly is.

Q. Now, you were asked -- and I forgot who asked you -- about fracing and fracing fluids, and you didn't seem particularly concerned about that. Could you elaborate a little bit on that?

A. Okay. I think anybody that's worried about the extent of the fracture, artificial fracture, should sit down and go into Schlumberger's office or Halliburton's office and sit down with one of their engineers and watch one of their demonstrations of a simulation of a frac job.

Because when you get down to 2600 feet or so or -- I would say, in most basins over 1,000 feet, you're going to have your vertical stress in your rocks is going to be the dominant stress. So you're frac is going to go in the direction of the dominant stress, and then the other direction of the frac is going to be in the next dominant stress direction, which will be one of your horizontal directions -- or one of your planar directions -- so your frac is going to go vertically, but it's going to go out -- it's going to be confined vertically by your shales above and below your zone of interest -- your high stress rocks above and below your zone of interest -- and your pressures that you observe during the frac job, you can actually tell whether the frac has broken out of a zone or not.

And there's no way that it can break out from 2600

feet all the way to the surface; that just absolutely could not happen. And the frac is widest near the well bore, narrowest from away from the well bore, and it's carrying sand or sometimes high concentrations -- hopefully higher concentrations -- of sand near the well bore so you can pack off the well bore with sand and that fracture that you induce through high pressure.

Hydraulic pumping is when you shut off those pumps; it closes on the sand and traps that sand and provides a good conduit to the reservoir flow to linear flow into the perforations and into the well.

And you can tell by your pressure plot, really, how successful you are on the frac. And you can also tell by the well, you know, how well it comes back. But you're limited by your pressure in your formation. Obviously the higher the pressure, the better to get you some good flow back. And if you don't have good pressure, well, you try to use a nitrified or an energized frac to help add some energy to the frac to bring it back and clean up the well and stuff.

Q. But if there are materials in the frac, in the frac fluids, that you don't want to be exposed, they will be coming back in that frac, won't they?

A. Some of them will be, they will. It's mainly water. It's a gel and it's a cross-linker, and it's nitrogen and it's a breaker -- sometimes an enzyme breaker, sometimes a

chemical breaker -- and then the other breaking method is a temperature, obviously. So there is some additives to it, but it comes back, and it's not going to be allowed to -- in the old days, they flowed it back to the pit and did something with the pit.

Q. So as long as the operator maintains his waste and the frac stays in the zone, it's --

A. Yeah. The frac is not going to stay. Even if it grows out of zone, it's not going to grow that much out of zone. And it's not going to be propped that far out of zone because that sand can only go so far. It's got gravity acting on it and where it didn't go, it's going to close up. So once you stop pumping, that's it.

And as far as what comes back, it's going to be contained in -- the service companies have been very good about this for years and as far as what happens during the frac job, you know, they're really strict on safety and on any kind of release around the well. As far as what comes back after the well has -- you let it come back, and you try not to sometimes let it come back too fast, but the fluids that are coming back are going to be contained in frac tanks or --

Q. Well, they're going to be contained as long as you release them to a pit and don't allow the pit to leak, right?

A. Exactly.

Q. Now, you talked a little bit about the rule against migration of fluids. And I forget the cite. It was an exercise where we looked it up, the anti-migration?

A. Yes. It's to prevent formations at different pressures and different compositions from intermingling. So there is a rule we've had against that.

Q. "We" being the OCD?

A. Yes.

Q. In fact, that rule has been in place for 70-some years, right?

A. Yes, it has.

Q. But it was originally intended to keep the water from harming the oil zones, wasn't it?

A. It does mention that in there, but because of a prevention of waste.

Q. But now it's come to be interpreted as against allowing fluids from any zone to migrate into any other area zone; is that right?

A. Well, it's recognized that there is a problem when fluids do migrate and intermingle.

Q. Okay. And --

A. And if you get a good cement job, you've gone a long way toward preventing that.

Q. I'm going to read you the rule on that. It says, "During the drilling of oil, oil well, injection well or

service well, the operator shall separate oil, gas and water strata above the producing injection horizon to prevent the contents from passing into other strata."

Section B, "The operator shall ensure that fresh water and water that has present or probable value for domestic, commercial or stock purposes are confined to their respective strata and are adequately protected by Division approved methods. The operator shall take special precautions and methods satisfactory to the Division in drilling and abandoning wells to guard against loss of Artesian water from the strata in which it occurs and the contamination of Artesian water by objectionable water oil or gas."

Is that the rule to your understanding, I assume?

A. That's exactly the rule.

MS. FOSTER: Chairman Fesmire, could I just ask you for the cite of that rule? And if that's been changed, the number?

CHAIRMAN FESMIRE: Well, it has officially been changed as of December 1st. It's 19.15.16.9.8(B).

MS. FOSTER: Thank you.

Q. (By Chairman Fesmire): You mentioned using this diagram that they -- I don't know whether it was on the Black Ferrell No. 1 or on another well that you were talking about -- that they opened the Bradenhead and found fluids; is that correct?

A. Yes.

Q. Was that the Black Ferrell No. 1?

A. Yes.

Q. Were those flows under pressure?

A. They mentioned some oil and water. They didn't say anything about pressure.

Q. So there was some communication between that area just under the surface there and the zones that were producing oil and water; is that correct?

A. There must have been. It's a mystery as to how it got in there, but unless it was swept with the original -- it could have been swept, I think, with the original cement job up to the surface and then trapped there.

Because the records on the actual depths of the intermediate casing was off at least 20 feet, and the mention that it circulated was not verified with anything. So that's why I didn't put those little cross-hair patches much further than the 364 feet up.

Q. But later when they went into it and found the casing -- that the casing wasn't competent so they probably shouldn't have been surprised that they had corrosion problems, apparently.

A. They had corrosion problems, and my theory is that it is because of all those years of intermittently producing the well on and off and it being open from 2600 feet

all the way to -- the annulus was open all the way to the surface. So there was possible corrosion that happened due to that.

It was bad enough for Tecton to feel like they needed to set a scab liner all the way from the surface down to right above the perforated interval. And then they tried to beat that horse further by perforating again and re-fracing the well. And so, just unfortunately, it hasn't been a good well.

Q. Did they set their pump above the perfs?

A. No.

Q. Sorry. Now, Ms. Foster mentioned something about the cuttings from water wells just are spread on the surface -- they are disposed of on the surface; is that correct?

A. That's -- from what the water wells I've seen being drilled over on the eastern side of the State, they're just, you know, water sand and caliche or whatever comes out.

Q. Are those cuttings generally contaminated with salt water or drilling chemicals?

A. No. I don't think so.

Q. So that's not the same situation as spreading oil and gas well cuttings on the surface; is that correct?

A. No, it's not.

Q. Now, you had a little discussion about waste. And there was some things said about leaving oil or gas in the reservoir if that oil and gas is not economically viable to

produce, if you're not capable of producing that oil and gas at a reasonable profit: Is it waste to leave it in the formation?

A. No, it wouldn't be. I wouldn't think so.

Q. Why would you say that?

A. Because it's -- if you've got it trapped there, someday it's like it was originally, and it can be produced as a price goes up. Or if some other method of enhancing the reservoir comes along, well, you may be able to do something with it as far as -- there's a lot of reservoirs that have some oil saturation in them. But they're not -- the oil's not recoverable under the current -- and maybe never will be recoverable.

Now, if you cover a good well with cement and try to maintain the pressure the way it was originally, well, you shouldn't -- I don't think that's called waste.

Q. But I know for a fact that you spent some time running economics for oil and gas prospects.

A. Yes. If you've got competing opportunities, you have to run economics, differential economics, to see if you've got -- and I think even a regulatory body, a lot of them demand that -- especially if there's competing issues -- they look at that. I notice the OCD hasn't required that as much as I've seen in like the Railroad Commission, the Southern Utes, the Williston. I've had to present economics to all those, and the only time we see economics presented here usually is for

waterflood proposals or for some competing -- oil companies are fighting each other on whether to do a certain procedure or not.

Q. Okay. The people that collect taxes and don't pay the bills, a well will be economic to them a lot longer than it will be for the operator, correct?

A. Exactly.

Q. But it's not waste if we cease producing at the point when the operator's not making any money, is it?

A. No, no. It's got to be economical.

Q. And, in fact, have you ever heard of a regulatory body demanding that somebody continue to produce because it was waste to leave uneconomic resources in the ground?

A. No. Detroit comes to mind right now, but I don't think -- that's a good point.

Q. Now, you ask a lot to compare Otero Mesa and the Galisteo Basin. Am I correct in seeing Otero Mesa is essentially a very water-rich region of the State; is that correct?

A. Very water-rich.

Q. In fact, the Salt Basin is considered by some to be the last of the big fresh water basins in New Mexico.

A. I think El Paso's acutely aware of that.

Q. But that's not the situation in the Galisteo Basin, is it?

A. You know, along faults you may have some water. I know you have water recharge in places, but from what I saw in the logs, the only logs that are available -- of course, the oil companies are not going to drill in areas that are going to be water productive. But I didn't see a big water productive capability here, especially below where they set their intermediate -- or their bottom of their pipe -- from there on down was really low resistivity.

And I think -- what is that, the lower Mancos and the Dakota? So that's still Cretaceous stuff. But it was really low -- high salinity stuff -- really high. But once you get from 2500 up to 1800, there was some stuff that looked like it was potentially 10,000 or so depending on how you interpret the logs, but there was no -- so it was protectable.

But I didn't see any big, thick sands that you can actually produce in any kind of qualities like they would in the Rio Grande Rift area or something.

Q. I guess what I'm asking you is that the statement was made earlier that a one-solution-fits-all probably wouldn't work when you compare Otero Mesa to the Galisteo Basin; is that correct?

A. That's correct.

Q. There are differences, aren't there?

A. There is differences in all of our basins, there sure is.

Q. Okay. One of the things that you talked about in your testimony was that there was a -- that we would be affording the water in the Galisteo Basin greater protection. Does that exist throughout -- if oil were to be discovered out there and if a field were developed, would the same rules apply throughout the life of that development?

A. They would. In the Galisteo Basin?

Q. Yes.

A. Yes, they would. The cementing rules --

Q. But I'm talking about some of the others things in there, the proposed rules on development plans and things like that. Would they apply to every well that was drilled out there?

A. It would need to be included in the plan. The plan would need to be comprehensive and -- it would include the wells and then the impact around those wells. The surface stuff -- I would need to refer that to Glenn, but it definitely would include all the wells.

Q. Okay. But it would need to be a flexible plan. You wouldn't incur the same costs for a development well, for instance, that you would incur for an exploration well?

A. No, you wouldn't. And that's typical in exploration and development. The exploration wells are the most expensive, as all of you Commission members know, and that the development wells progressively get cheaper as you learn

more about drilling methods and what pipes you need to set at certain depths and get more efficient. And actually, the contracting to do more wells at once, that kind of a thing, less coring, it definitely gets cheaper.

CHAIRMAN FESMIRE: Ms. MacQuesten, do you have redirect for this witness?

MS. MACQUESTEN: Yes, I do.

REDIRECT EXAMINATION

BY MS. MACQUESTEN:

Q. Mr. Jones, I'd like to take you back to a question that Mr. Hall asked you in cross-examination. And paraphrasing here, but he asked you something about whether the OCD presented more hydrogeologic and geologic testimony when it proposed its rules for Otero Mesa and Sierra Counties than it's presented here today, and you agreed that was true, did you not?

A. Yes.

Q. You were here for the hydrologic and geologic testimony of Mr. Morrison from the State Engineer's Office?

A. I was.

Q. And do you remember him talking about the complex geology in the basin?

A. Yes.

Q. And the faulting?

A. Yes.

Q. And do you remember him saying that the geology conditions change if you move just a short distance?

A. Yes, I do.

Q. And do you remember him saying that water quality will change if you move just a short distance?

A. And that's something he would uniquely know.

Q. Are you aware of any evidence that would contradict Mr. Morrison's testimony on this?

A. I think his knowledge is from 500 feet up, but that's the only thing I would say about that.

Q. Do you know anything about -- is there information lower than 500 feet?

A. Well, I take that back, yes. There's obviously wells north of Santa Fe that's drilled 1,000 feet, really good water. But as far as potable water, that's -- I think your question was --

Q. Do you disagree with Mr. Morrison's testimony?

A. No, I don't.

Q. Do you remember that he recommended a site-specific analysis because the conditions were so changeable?

A. He did.

Q. Do you agree with that?

A. Yes, I do agree with that. I think once a structure gets identified, an oil and gas structure, and if

they ever hit a structure out here that actually produces, I think then you know the limits of that structure and you're going to -- then things will be a lot clearer within that boundary.

Q. So are you saying that while -- when we are at the point where conditions are not well known, we should do a site-specific analysis?

A. Yes.

Q. But you're willing to say that at some point you may get enough information to be able to generalize to a certain extent?

A. Yes. I think -- site-specific meaning -- what I'm looking at here, the logging and the mud logging and the -- I think that is fine on every well. There's nothing wrong with doing that on every well. Because I agree, things can change real rapidly.

If fresh water is encountered a lot deeper, it's usually, in my experience, has been because of some kind of fault that the oil companies did not want to drill into anyway. But all of a sudden they encounter it, and it's fresh water at great depths. And it gets turned over to a rancher or something, you know.

But it can change really quickly, and he showed the fault coming from Lamy all the way across, and you can see it on the surface out there, that big fault when you're driving

through Lamy, you can see that. But there's definitely some geologic events that have happened.

Q. You testified that the OCD already can put site-specific conditions into an APD; is that right?

A. Yes.

Q. Is that done at the district level now?

A. Yes.

Q. What position in the district?

A. District geologist.

Q. Does the district geologist also review the spacing of wells to make sure that the spacing that the operator is proposing is applicable spacing rules?

A. They do, on the bottom producing interval proposed in the well.

Q. What district is Santa Fe County in?

A. District 4.

Q. How many people staff the District 4 office?

A. One person.

Q. So that one person handles well spacing issues and the setting of conditions on APDs?

A. Handles everything.

Q. Inspections?

A. Inspections -- well, he can ask for help from our Environmental Bureau, but it's one person.

Q. Have you worked with the person who is

District 4?

A. Yes.

Q. For how long?

A. He's been in that -- the current position District 4 has been filled since -- the last guy, Roy Johnson, retired. And Roy had been there for 20-plus years, and I think Ed Martin is the current one, and he's been there for, I would say, three years.

Q. Okay. Did you work with him before he became District 4?

A. Just barely. He was in the Environmental Bureau.

Q. Are you aware of his educational background?

A. Yes.

Q. Is he a geologist?

A. No.

Q. So under the current rules, a non-geologist would be looking at well spacing and would be imposing conditions on the APDs for wells in this area?

A. Yes. But he'd have to follow our rules. But the rules are there, but whoever mans the district has to follow the rules.

Q. So we have an area of complex geology with a non-geologist imposing conditions on APDs under current rules?

A. Yes, that's true. He could always ask for help.

Q. Under the proposed rules, does he get that help

automatically?

A. Yes.

Q. Under the proposed rules in Section 10, do the rules provide default provisions that would apply to APDs unless an operator can come forward and show that they're not necessary?

A. They do. They do.

Q. And in Section 9 that involves Exploration and Development Plans, does that provision allow for the OCD to impose conditions on an Exploration and Development Plan?

A. They do. And that would be after notice and hearing.

Q. Could that provision be used to address situations such as the one Commissioner Olson brought up about saltwater disposal wells that might be proposed in this area?

A. Yes.

Q. There was another question from Mr. Hall to the effect that the OCD have not mapped the aquifers in the Galisteo Basin?

A. Yes, I remember that question.

Q. And I believe there was also a question about whether we had conducted studies based on the water well information that was available?

A. Yes.

Q. Are you aware of the two hydrologic studies that

have been introduced into evidence from the Office of the State Engineer?

A. I -- yes, I am.

Q. At least from being present for testimony?

A. From being here.

Q. And were you present when Mr. Morrison testified that that information was based on the available information from the water wells?

A. Yes, that's true, it was.

Q. Before an area is developed for oil and gas, does the OCD go out and dig wells to gather data for the operators?

A. No.

Q. Do we have the authority to go out and dig wells?

A. No.

Q. There was some questions about protection of fresh water, and I would like you to think back to the testimony from Mr. Morrison from the State Engineer's Office. Do you recall him stating that the State Engineer's Office is going to assume that any water in the Galisteo Basin is fresh water unless shown otherwise?

A. Yes, I remember. And also the discussion about the 2500 and possibly hydrologically connected below that.

Q. And was it your testimony also that the OCD's obligation under the statute is to protect fresh water?

A. Yes.

Q. So what is our obligation as to any water found while drilling in the Galisteo Basin given the assumption of the State Engineer's Office that it is fresh?

A. We determine on a well-by-well basis whether it is fresh or not. But we plan on it -- the operators will have to drill their wells with one size too big a casing, basically, which will add a little bit of cost to basically almost every -- especially every delineation or wildcat well so they can have the capability of running one extra string of -- casing. And it will protect any -- and fresh waters will be determined as the well is logged or mud logged or both, and that any fresh water -- anything less than 10,000 TDS will be covered with two strings.

Q. Do I hear you saying then, that the assumption is that the water is fresh and will require protection unless it is shown by the operator through the process of gathering information that it's not protectable water?

A. Yes. And they can't afford to drill a well that doesn't have the capability of running the extra string of pipe, so they will plan on that accordingly.

Q. I'd like to refer back to a question from Commissioner Bailey who was asking about if an operator drills a well in an undeveloped area -- something to the effect that he won't know where to put his second well until he drills his first one. Do you remember that?

A. Yes.

Q. How many wells is Tecton currently proposing?

A. I saw three. I think they had proposed more earlier, and now the current proposal is three.

Q. In your position at OCD, do you deal with administrative permit applications?

A. Not to drill.

Q. Okay.

A. Just for exceptions to our rules.

Q. Could you give us some examples?

A. Surface commingling, downhole commingling, saltwater disposals, nonstandard locations.

Q. And you also serve as a Hearing Examiner when these matters are disputed?

A. Yes. Or they are required to go to hearing for other reasons.

Q. In your experience in hearing those cases, do operators make representations to you about their plans for future developments?

A. No.

Q. How about a waterflood situation? Do they talk about it one well at a time, or do they tell you what they plan to do for the project?

A. The project -- for a waterflood, it's the only situation where multiple wells are discussed.

regulatory agencies; is that right?

A. Yes.

Q. Do operators tell investors what their plans are for future development?

A. Yes.

Q. In your experience dealing with the applications that you see from operators, if an operator doesn't think through its plans for future development, can that cause problems for the operator down the road?

A. Oh, yes. What really comes to mind is pipelines and facilities. That needs to be -- you have to have enough reserves that you can develop before you can justify big pipelines or, for oil facilities, it's not as bad, but you still need to handle your gas coming from oil wells.

Q. Does it make sense -- you talked about the economic analysis. Does it make sense to go into an undeveloped area that doesn't have infrastructure and drill one well without thinking forward as to what your next step is going to be?

A. No, it doesn't.

Q. What purpose do you think an Exploration and Development Plan serves in requiring operators to give information of their intentions regarding future developments?

A. I think a plan is valuable. It's valuable not only -- the operators have a plan, whether we see it or not.

Q. What about pooling orders?

A. Pooling -- you mean special pool rules?

Q. Special pool rules or pooling an area?

A. The geologist basically decides if one stratum of oil or natural gas is one common source of supply, so they determine that to be one pool of oil or natural gas. And then if an operator or the OCD decides there needs to be special pool rules for that pool, well, then, it's heard at the notice in hearing.

Q. And in deciding the special pool orders, is well spacing one of the issues that can come up?

A. Most commonly well drainage area is one of the big things that come up.

Q. And do the operators make representations as to the number of wells that they're going to have to properly drain the area?

A. They do. For a -- yeah, they do. And by that time, they've -- at least they think they have the area delineated enough to -- and they have enough knowledge on it to decide whether -- how much well density or the spacing, which is two different things, but anyway --

Q. So are operators willing to come forward with representations about their future plans when they need to?

A. Yes.

Q. You've worked in the industry as well as in

They have some sort of plan. Oftentimes, preparing a plan for view by a regulatory agency, they actually -- it actually gets debated a little bit even more thoroughly even within the company itself.

But as far as the purpose it serves, it would serve to put everybody on notice who statutorily is responsible for different things that would be affected by oil and gas drilling.

Q. Does it serve a purpose for the operator as well?

A. Oh, yeah.

Q. How so?

A. Well, it -- you need to know your plan. When you're drilling rank wildcats, you're looking sometimes just for statistics to know how to step further in drilling like on structure wildcats or something like that, and then drill some more development wells.

But if you don't have -- you can't roll the dice to drill a wildcat well without knowing how big the prize is that you're going to find. So you need to have to make some sort of estimate about the reserves that you're going to potentially find when you drill wildcat wells. So operators in exploration groups traditionally run risk economics. And what that is, is it'll do a Monte Carlo simulation of drilling where you put in the minimum and maximum reservoir size that you think you're going to find, and then the model rolls the dice enough times

and spins the money for each well.

And then you have a certain risk factor so if your risk factor is one in four, which is a really -- actually a good risk factor for a wildcat well, well then, if it rolls the dice enough times, then 25 percent of your wells will hit. And then 75 percent of your wells will be dry holes.

But then the wells that do hit will have a certain size of reservoir that will be developed from those. So it's just a quick summary of risk economics, but somebody has to do it, unless you can talk some investor somewhere into investing a bunch of money where you don't give them an idea of what they can get, but most investors should be smarter than that.

MS. MACQUESTEN: No more questions. Thank you.

CHAIRMAN FESMIRE: Mr. Hall?

MR. HALL: Thank you.

RECROSS-EXAMINATION

By Mr. Hall:

Q. Mr. Jones, I want to ask you since you were asked about economics, in the course of the Division's crafting of the proposed rule, did the Division consider the economic effect on operators of implementing these rules at all?

A. I thought about it, at least as far as the surface on down what will happen. As you know, the cost of drilling have both skyrocketed in the last ten years, along with the prices.

Prices of drilling are so fluid, but undoubtedly there will be more cost to having to start your hole bigger in size and then possibly running an extra string of casing, so I thought about it. As far as the surface stuff, that will be -- I didn't work on that.

Q. Okay. I'm still struggling to understand what the Division's expectations are when an operator is to describe a plan area and its E&D Plan submittal. And Commissioner Bailey asked you about some of the special pool rules cases you recently sat through and participated in, and as I understood your response to her, are you looking for an operator to try to delineate the productive limits of a common source of supply? Is that what you're --

A. The surface impacts, obviously, there needs to be some estimate of what might be developed, but the way I envision it, the plan would come forward and there would be some kind of estimate made about how many wells will be drilled and what spacing and well density, at least. And then that would be accounted for. And then if there was a revision due to some fortunate fact that they actually discovered something, then they would come back for a revision.

Q. After five years, we convert from an approved plan to special pool rules, correct? Is that the way it works?

A. I am not probably -- I better defer to the next witness on that. That is something I'm not --

Q. Well, you addressed it briefly to Commissioner Bailey is why I'm asking you.

A. Yes. The special pool rules has to be only for the wells that are for the pool boundary. You know, you have to have a pool, so you have special pool rules for it, and you don't have a pool until you have at least one producing well in that pool. And then everything within a mile around the boundaries of the spacing unit that that well is in would be included -- would have to obey the special pool rules.

Q. Okay. Are we going to follow the process currently in place for nomenclature cases and pool extension cases where you step out of pool boundaries a proration unit at a time? Is that what you envision?

A. I haven't -- I wasn't even asked to cover that in this plan, but I better not. But I can't imagine it not being that way.

Q. Okay. And so then anything within a mile of the boundary of the E&D Plan then converted to special pool rules area would be undesignated portions of that same pool, correct?

A. Correct.

Q. And those same provisions would apply to that new, one-mile area as well. Is that the way it works?

A. I would -- we would have to hear the plan. I hate to -- I wouldn't want to extend the effect of the pool beyond the one-mile boundary, if that's what you're saying. I

wouldn't want to do that. If the effect of like a well drilled real close to the one mile outside of it, I don't think, unless there's other surface effects, that basically Wayne Price's group would be concerned about.

Q. Okay. And you're aware of some of the one-well science projects we're doing around the State like in the Tucumcari Basin right now out in the middle of nowhere?

A. Yes.

Q. Could you do a single well E&D Plan in Santa Fe County?

A. Yes. I don't see why not.

Q. You don't want to preclude that, do you?

A. No, definitely not.

Q. So it wouldn't be necessary for an operator to give you a full-blown plan for future development when all they are looking at is a single well?

A. No, it wouldn't, if that's definitely all they're looking at.

Q. Let me ask you one more question, since you had a hand in 9(B)(7), (c)&(d). And (7)(c) -- (B)(7)(c), your mud logging program provision --

A. Okay.

Q. -- you used the term -- well, the term is used "fresh water zones."

A. Yeah.

Q. And my question is: Is there a special connotation to the use of zone? In other words, is that an established geologic term such as "member" or "interval"?

A. That was put in there, and I kind of objected to that as a non-geologic terms myself. So I think I better -- the only thing we can say on that is it's a lens. It's a geologic lens.

Q. Well, you're asking for mud logging data on fresh water zones. So what is the operator to do, in your view, if a formation contains fresh water but not through the entirety of its vertical extent: Do you have to provide data for the full extent for that formation or just the saturated portion? What are you looking for?

A. The logs would be surface to TD. As far as the mud logs go, they would be that way, too. But it would just be the lithologic description of the thickness of that sand and anything else that the mud logger can show, you know, drill times, basically the -- are you saying a fresh water zone above a producing zone? What would the mud logger show on that?

Q. Well, what I'm driving at is when the Division would act to protect fresh water and do so in a fresh water zone, is it looking only for, say, special casing and cementing protocols in the saturated portions of the zones or the entirety of the formation?

A. We didn't zero out potential produceable fresh

water from this. We just proposed to the Commission fresh water, which is defined by the Sate. So we didn't -- even if it can't be produceable, I mean -- or like, you know, ten barrels a day of water, if it's fresh, we propose it to be covered with two string of pipe.

Q. Okay. I understand. No further questions, Mr. Chairman.

CHAIRMAN FESMIRE: Ms. Foster?

MS. FOSTER: Thank you.

RECROSS-EXAMINATION

BY MS. FOSTER:

Q. I'm following up on the same line of questioning: The operator would need to put down a second string if he's in fresh water or there is fresh water detected?

A. Yes.

Q. Okay. And how is this operator supposed to detect that he's less than 10,000 TDS?

A. That would be the communication, the daily mud log to the Division. Obviously, the operator has a geologist watching his well also and an engineer, and a log analysis of the logs would show whether there is fresh water, and at that point, you have to either look at your casing program. So you have to have enough casing on site to do all this. You would have to.

Q. But you would actually be able to determine and

test the quality of the water on site without stopping operations or halting --

A. The electric logs is the only way unless you stop and do a drill test and we didn't propose that.

Q. So but you can determine the quality by electric logs?

A. Yes. Infer -- it's an inferred quality.

Q. Okay. And this is going to be an inferred quality by the company geologist?

A. It's going to be presented by the geologist or the petri-physicist from the company and agreed upon by the OCD.

Q. By the non-geologist that's heading up District 4 right now?

A. He would have to review that analysis.

Q. Okay. Now, what were to happen in an instance where you have operator that decides to air drill, for example, his first string and the cuttings at some point start coming up wet. Is that an assumption that you've hit a fresh water zone?

A. You would log it and then determine whether it was considered less than 10,000 or not.

Q. Okay. But is there going to be any sort of a question in terms of the porosity of the cuttings? Is there a determination that operators would have to know when cuttings would be considered wet enough to be considered a fresh water

zone?

A. No. The mud log, or the sample descriptions, would help determine whether it's a big, thick saturated sand or sand that would be capable of definite production of water. And then the logs would have to be run to determine that. So you're not going to know until you either run logs or case it off and then run interior, inside logs, on your casing -- your cased hole logs.

Q. So it sounds like there's a possibly that you would have to stop and case it off if you end up with wet cuttings?

A. Yes. And that's -- drillers like up in Wyoming or in the Gulf Coast, they have to allow for potential changes in lithology that would cause them to stop and set pipe, something like that.

But, you know, in this case, all we're asking for is two strings of pipe cemented would cover that. You know, you could always keep drilling and then do it later.

Q. Okay. Now, you stated on direct that companies make estimates on how big the prize is going to be and that's when they do the risk economics?

A. Yes.

Q. As it sounds like to me -- and correct me if I'm wrong -- that this type of information, this risk economics information, would be useful to you as part of the E&D Plan.

A. They're not going to know -- they're going to be able to present maybe a most likely, you know, a geometric mean, maybe, size of the reservoir that they're hoping to get. In order to drill a $3 million well, you're not going to drill one if you think you're only -- if you hit something, you're only going to be able to drill offset and that's it, because it wouldn't be worth the cost of the risk. So it would be useful information. Yes, it would.

Q. Okay. But isn't this having the OCD kind of enter the foray and making business decisions for a company? In other words, you're reviewing their business decisions and risk economics if we have to give you that information?

A. The plan, as I envision it, is just the amount, the size of it, will determine the potential impact of surface impact reasons. But you're right in what you're looking at if you're strictly looking at it from that standpoint, is that if they come -- and Mr. Hall probably was getting to the same point -- is, you know, what we're going to drive them to do is come to us with a one- or two-well plan.

Q. Well, that was going to be my next question. With the EDP, the Economic and Development Plan, being as stringent as it is presented here in the rule, wouldn't it make more sense for an operator if you are going into a wildcatting area to do an Exploration and Development Plan for one well to see what you're going to find?

A. It does, and there's nothing wrong with that. But then when you go to expand it, then you'd have to get a revised plan. You'd have to go to hearing to get a revised plan.

Q. Well, you would require us to expand it? In other words, amend the original Exploration and Development Plan? Or could we come in and say: We've done one, it's reasonably successful, and now we'd like to do or we think that, you know, there's a pool here, and we'd like to do four or five more. And, therefore, we will do a larger Exploration and Development Plan for the second request?

A. That's the way I envision it. I was just focused on downhole stuff, but that's definitely -- this is not something to stop development. It's something to prevent waste, protect correlative rights -- but to protect the fresh water. And put everybody on notice that this is happening.

Q. Right. Put everyone on notice that this is happening. Now, correct me if I'm wrong, but the Exploration and Development Plan really is to look for statistics and information on this potential pool, correct, to give you information at the OCD?

A. As far as the downhole part of it, we would be looking at -- different groups would be looking at the effects on their -- what they're looking at. Wayne Price's group would be looking at surface impact of, like, drilling ten wells, and

the cultural affairs people, they could get involved if they want to or something, but as far as the downhole stuff, you know, every well is going to be pretty much logged and mud logged, so it's not -- as far as from what I was looking at here, it's not --

Q. But we'll be giving you more information as you develop a potential future pool, the downhole stuff -- information that we give you?

A. Yes.

Q. Okay. But for everybody's Economic Development Plan there has to be public comment and a hearing, particularly if there's a new one or if there's an amendment, correct?

MS. MACQUESTEN: That misstates the rule, Mr. Chairman.

CHAIRMAN FESMIRE: Is that an objection?

MS. MACQUESTEN: Objection.

CHAIRMAN FESMIRE: And the objection is?

MS. MACQUESTEN: She's assuming facts not in evidence. The rule states -- speaks for itself. It provides for an automatic public hearing at the initial Exploration and Development Plan stage and a public hearing may be held on amendments. It's not required to be.

CHAIRMAN FESMIRE: Okay. Ms. Foster, would you like to rephrase the question?

MS. FOSTER: No. I just appreciate the correction.

Thank you.

Q. (By Ms. Foster): Now, Commissioner Fesmire asked you about the quality of the sands that come up when people drill a water well. Is it possible that those sands could come up with greater than 250 milligrams or kilograms of chlorides?

A. Yes, it is. According to this, from what I saw here from the State Engineer, he did show that some waters -- I thought I saw some 2500 TDS waters that were sampled when they tried to get fresh water.

Q. Okay. So they could come up with -- it's not fewer sands when you're drilling a water well. They have contaminants in the sands?

A. Yes.

Q. Naturally occurring contaminants?

A. Yes.

Q. Now, listening to your testimony on both direct and cross-examination and recross-examination, it seems to me that this rule really should apply to wells that are in the exploration phase, or basins that are in exploration phase, as opposed to a development phase. Is that an accurate statement?

A. The downhole stuff that I was talking about, I definitely think that any wildcat all over the State would be benefitted by that. As far as the potential surface impact and the notification to, you know, the local authorities, that would be a different thing I would assume. I'm just not as up

on the surface stuff as --

Q. But then for the downhole stuff, would it be fair to say this could actually be for wildcat rules for the State?

A. It could be. I would go through a -- you know, obviously, you know, it would need to have enough flexibility, because all basins are a little bit different, and you don't want to, you know -- just the more rigid you are with requirements, the less, you know, chance you have to let people actually get the drilling done.

Q. Right. But if the purpose of this rule is to get more information to understand those basins, then requiring the information in your Exploration and Development Plan with the additional monitoring and the mud logging from the surface and all that, would eventually give you that information. In other words, you wouldn't need as much information in a developed basin than you would in a wildcat basin?

A. No. You definitely need more information, not only where the potential -- where the lithology, where the oil saturation is and where the protectable water is, then you definitely don't need that in all areas.

Q. Okay.

MS. FOSTER: I don't have any other questions.

CHAIRMAN FESMIRE: Mr. Hall, do you have any more questions?

MR. HALL: One question. I asked you about the

horizontal limits for E&D Plan areas in special pool areas. I didn't ask you about the vertical limits. Are there to be any?

THE WITNESS: I think as far as from the well to the surface, that would be -- and then on the surface from the well's TD to the surface. But that is kind of a good point because Tecton's other wells are proposed to be actually deeper than this Black Ferrell well, so it would be from, you know -- that would have to be presented as part of the plan as to what the proposed depths would be and how they would affected. That's a good point. Thanks.

MR. HALL: Thank you.

CHAIRMAN FESMIRE: Commissioner Bailey or Olson?

COMMISSIONER BAILEY: No.

COMMISSIONER OLSON: I just have one question.

FURTHER EXAMINATION

BY COMMISSIONER OLSON:

Q. I know I brought it up before, but you had just gone over it a little while ago. It's back to the potable water again. You seem to be implying that people in the Galisteo Basin are only using potable water as a source for residential wells. Are you aware that there are a number of wells in the Galisteo Basin that use water that's considered non-potable for residential uses?

A. Actually, I wasn't aware of that. And I'm sorry I gave that impression, but what I'm trying to say is that the

naturally occurring shallow, fresh water sands that should be protected -- but we've got it in our rule to protect all fresh waters that are anything less than 10,000 TDS. But you know, the depth of setting the surface pipe is the main thing I'm talking about.

Q. Well, I guess I just come back to the protection of fresh waters in the rules. And, I guess, would it surprise you that there are a lot of wells in the Galisteo Basin that supply water for residential use that are considered non-potable?

A. Over 1,000 TDS?

Q. Yes.

A. It would. I didn't know that. Did I use the reverse osmosis units on them?

CHAIRMAN FESMIRE: He asks the questions; you give the answers.

THE WITNESS: I definitely was not aware of that. But I'm not implying that only potable water should be protected. But, you know, I guess from what I saw in the induction logs -- I didn't see any induction logs from 1800 feet up. That's a good point.

But from 1800 feet down to 2500 feet in that particular well, I didn't see any sands that could give up any measurable quantities of water to actually -- you know, maybe one or two households. But, you know -- and it definitely is

in our plans to protect that water, but it's not something that you could drill into for a big -- at least in that well. You know, we didn't have enough logs, I admit.

And geology, as you know, is so variable, and there is faults that can have high-volume waters, but there's a difference between tight reservoir rock that might have some waters less than 10,000 TDS in it than the Rio Grande Rift where you've got tertiary sediments that fell in on the last less than ten million years. And they're unconsolidated and they're charged up with fresh water, you know, like Rio Rancho might be doing.

That's what I'm saying. You can't get that much water. They can't even get that much water out of their perforated zone, and that's the biggest sand in that well. And, you know, it don't come out with the oil. So the permeability is not there.

Q. (By Commissioner Olson): But you seem -- I'm getting confused. You seem to be implying that if it doesn't have good permeability, then the water quality is poor.

A. No. The water quality is definitely not poor. But it's not very good, but it's not poor. But it's protectable, and we are proposing in this rule to the Commission that those types of waters be detected and protected with two strings of casing and two cement sheets over the whole thing.

Q. And I might point out -- I guess it was presented earlier in OCD Exhibit 40, if you look at Figure 2, which had TDS water quality from water wells within the Galisteo Basin. That if you look at that map, there's approximately 50 wells within the basin that are being used as water wells of what you consider to be non-potable water; is that correct?

A. That's what -- it shows that a sample was collected, and they got that high TDS. I don't know exactly what they're doing with those wells.

COMMISSIONER OLSON: That's all I have.

FURTHER EXAMINATION

BY CHAIRMAN FESMIRE:

Q. Okay. Mr. Jones, in response to a question from Ms. Foster, you said that if they got 2500 parts per million water sample that the cuttings would have 250 milligrams -- 250 parts per million salts, the cuttings to get down to that zone. Did you mean to say that?

A. As I understood, it was --

Q. You described one water sample in there at 2500 parts per million, and her question was: Does that mean that it -- the way I understood her question was -- does that mean that the cuttings have 2500 hundred parts per million salts in them, the cuttings that might be left on the surface after a water well is drilled?

A. What I meant by that is that the waters that are

in the rock that might have that TDS. It's just what Commissioner Olson just said.

Q. So it didn't have anything to do with the cuttings that might have been left after?

A. No. They're -- no.

CHAIRMAN FESMIRE: Okay. Anything further, Ms. MacQuesten? You want to do this again?

REDIRECT EXAMINATION

BY MS. MACQUESTEN:

Q. Mr. Jones, you were asked about the economic consequences of the proposed rules, and you suggested that this will increase the cost for operators. Did you also consider costs associated with cleanup if protected measures were not taken?

A. No. And it would be obviously considerable.

Q. There was a question about what would happen if an operator wanted to show that water encountered was more than 10,000 TDS and therefore not protectable, and the suggestion was made that the non-geologist supervisor of District 4 would be the person to consult. Is there anything in the rule that would prohibit the consulting person to be the hydrologist with our Environmental Bureau?

A. No, not in the proposed rule.

Q. And could that, in fact, be a condition imposed in the Exploration and Development Plan that a hydrologist with

our bureau be consulted in this?

A. The Commission could specify that the logs and mud logs be reviewed by a geologist or hydrologist or both.

Q. But not only the Commission could do it in this rule, but as each Exploration Plan is developed --

A. Oh, yes.

Q. -- that's the sort of the condition that might be built into some of these programs?

A. Yes.

MS. MACQUESTEN: That's all. Thank you.

CHAIRMAN FESMIRE: Mr. Hall?

MR. HALL: Nothing more, Chairman.

CHAIRMAN FESMIRE: Ms. Foster, on that subject?

RECROSS-EXAMINATION

BY MS. FOSTER:

Q. And in the instance where you have a hydrologist, a geologist, and whoever at OCD wants to review the rule, is the drilling going to be halted at that point?

A. The drilling would be halted to run your logs, and they would evaluate the logs right then and decide if -- and then the drilling engineer would have to be told basically what's going to happen from then on. He would need to know that or she would need to know that so they could make a decision about how to comply with this rule about double cementing of fresh water intervals.

Q. What I hear you saying, then, is every day the logs are going to run, and every day the operators are going to have to stop at some point for a review by the OCD until we get an answer back and then we can continue and decide if we're going to direct casing?

A. No. I apologize for that.

Q. Okay.

A. The mud log would be faxed in or electronically sent in every day. And that information would be continuously monitored, but that's the electric logs would have to be run to actually tell you on the intermediate and the final string what's going to be done, and you don't do those until you finish drilling. So you definitely would not stop drilling.

Q. But don't you have to run daily mud logs?

A. But that's actually continuous. As the well is being drilled, that mud log is being created, so it's a continuous log. They do electric logs continuously in some areas of world, but we don't do them here in New Mexico.

Q. Okay. And what do you do in instances if the person you are electronically mailing your mud logs to happens to be out of the office that day or on vacation or on leave? Is there an automatic person that would cover for that so that you get a quick response?

A. That would have to be accounted for, yes. The rule can say that.

Q. Okay. Could we put in the rule something like it has to come back in four hours or something, the answer?

A. Whatever the Commission wants to do. But I definitely agree that it should be a rapid turnaround.

Q. Thank you.

MS. FOSTER: No further questions.

CHAIRMAN FESMIRE: Commissioners?

COMMISSIONER BAILEY: No questions.

COMMISSIONER OLSON: No questions.

CHAIRMAN FESMIRE: At this time, we're going to take a break until ten minutes after 3:00. It's my intention today to go until 4:30. I guess Mr. von Gonten will be the next witness; is that correct?

MS. MACQUESTEN: That's right.

CHAIRMAN FESMIRE: To go until 4:30, take public comments and be adjourned by five o'clock, okay? We'll see you at ten minutes after 3:00.

[Recess taken from 2:52 p.m. to 3:10 p.m., and testimony continued as follows:]

CHAIRMAN FESMIRE: Let's go back on the record. Let the record reflect that this is a continuation of Case 14255, that all three Commissioners are present. We therefore have a quorum.

I believe we were going to start with the direct examination of Mr. von Gonten. Mr. von Gonten, would you

please stand and raise your right hand?

GLENN VON GONTEN

after having been first duly sworn under oath,

was questioned and testified as follows:

DIRECT EXAMINATION

BY MS. MACQUESTEN:

Q. Would you state your name for the records?

A. Glenn von Gonten.

Q. And where are you employed?

A. I'm an employee of the Environmental Bureau of the Oil Conservation Division.

Q. What is your title there?

A. Senior hydrologist.

Q. Would you please summarize your educational background for us?

A. I have a Bachelor's degree in geology from Texas A&M University, and I have a Master's degree in geology from the University of Texas at Arlington.

Q. Could you summarize your work experience relevant to geology and hydrology?

A. I've been a geologist for the past 30-some years, the first 14 years of which were in the oil and gas industry. I worked initially as a mud logger, as a well-site geologist. Then after receiving my Master's degree, I went to work for a couple of major oil companies. After that, I worked for the

Commonwealth of Virginia in their Department of Environmental Quality and hazardous waste program as their senior geologist.

In 1999, I moved from Virginia to Santa Fe and worked from 1999 to 2005 in the Hazardous Waste Bureau as a supervisor doing permitting and corrective action for facilities. Four years ago, approximately, I moved or transferred over to the Environmental Bureau in the OCD, and I've been working there as a senior hydrologist.

Q. Have you testified before the Oil Conservation Commission in other cases?

A. Yes, I have.

Q. And were you accepted as an expert in hydrogeology?

A. Yes, I was.

Q. I offer Mr. von Gonten as an expert in hydrogeology.

CHAIRMAN FESMIRE: Is there any objection? Mr. Hall?

MR. HALL: No objection.

CHAIRMAN FESMIRE: Ms. Foster?

MS. FOSTER: No objection, Chairman.

CHAIRMAN FESMIRE: Mr. von Gonten is so accepted.

Q. (By Ms. MacQuesten): Mr. von Gonten, your testimony is going to address some of the items that have been included in the Exploration and Development Plan?

A. That's correct.

Q. Specifically the items listed in numbered paragraph 1 through 8 of Subsection B of Section 9?

A. That's correct, with the exception that Mr. Jones, Mr. Will Jones, testified on the mud logging program and the logging programs.

Q. Okay. And would you give us an overview of remaining items in paragraphs 1 through 8 and why they need to be included in the application?

A. Well, that section requires operators to submit an application for an Exploration and Development Plan and that application must include general information, maps, hydrogeologic and site reports, plans to minimize the overall impact on the environment and written contingency plans to address releases.

The intent of Rule 9(B) is to ensure that human health and the environment and fresh water is protected by requiring the operator to proactively address his operating and development program holistically, that is, rather than on an ad hoc basis as certain foreseeable events occur. Rule 9(B) requires operators to do its homework up front and to provide OCD and all interested persons with the results of advanced planning.

Q. You've been present for all of the testimony so far in this case, haven't you?

A. Yes, I have.

Q. Some of the questions that have been asked have characterized the rule as solely a rule to gather information. Do you agree with that assessment of the rule?

A. No, I don't.

Q. Why not?

A. Well, it does have that aspect, but it also requires the operators to put into effect the proposed plans that actually require activity such as a monitoring program, also such as the mud logging program and the logging program. Those programs have the impact of gathering information, but they also require the operator to perhaps take a response as the result of a release that might be defective at a monitoring program.

The contingency plan would require action. It isn't just information gathering. In fact, it doesn't really address any information gathering. It just requires the operators to submit a plan to address any releases that might occur. They should have a plan in place that addresses proactive prevention of releases in the first place.

Q. Mr. Brad Jones, who testified on the 11th, went through a number of the items that you are also addressing. Do you recall his testimony regarding those contingency plans?

A. I do.

Q. And was there anything that Mr. Jones said that you disagreed with?

A. Yes. I think he misstated that -- I believe Mr. Hall asked him a question as to whether a spill of something like one quart of transmission fluid or whatever example he brought up, whether that would be addressed by the contingency plan. I believe that Mr. Brad Jones answered that, no, it only dealt with things around the well site.

The intent of OCD's Exploration and Development Plan -- the purpose of the contingency plan is that operators deal with releases when they do occur in a proactive manner. They are not allowed to just say, "I don't have to worry about that. It's only transmission fluid. It's not near the well site."

If a truck were to turn over on the road some distance away and it was hauling crude oil, until such time as a pipeline was there, they would certainly have to address traffic accidents. And there is the language -- specifically it says there is no de minimus provision. And this is to compare and contrast with our Rule 116, which requires reporting. We would expect operators under an ED Plan to report any spills and take proactive action that was needed at the time, whether it was a five-gallon bucket of pipe dope or one quart of transmission fluid or a blowout.

Q. Would you require them to file reports under 116 for amounts that wouldn't be otherwise covered by 116?

A. Yes. They would -- I would envision they would

at least have to make a verbal report and that might also be something that should be noted on the daily report that is given at the same time as the copy of the mud log. Let's use the example that was proposed to Mr. Jones about a small spill of transmission fluid or something like that. What sort of action would you expect, or what sort of plan would you want to see, in a contingency plan to deal with such things?

The contingency plan doesn't have to take into account every possible scenario, but you can certainly say that there would be a commitment that any leak or spill would be addressed first by remediating or mitigating the release; if there's no further release then cleaning up the release. If it's reportable under Rule 116, then it would also be reportable. But also to take steps -- a commitment to take steps to fix what's broken.

Valves do break; they do wear out; there is vandalism; for example, someone may have a tank battery and somebody with too much time on their hands may decide to drive by and shoot a hole in it, and it would result in a release. It doesn't mean that the operator is operating in an irresponsible manner, but for the special provisions of Santa Fe County and Galisteo Basin, we would expect that they would take immediate action. And that action could be as simple as taking the one-quart spill, shoveling it into a 55-gallon drum and then disposing it properly at the end of the -- at the

well -- and they're getting rid of all their other surface waste or their other oil field waste.

Q. Mr. Brad Jones ended up testifying and being cross-examined on a number of these items numbered paragraphs 1 through 8. Were there any other statements that he made or discussions that he had with counsel that you would like to comment on?

A. I think there is. There was one comment that I think he made, and I think his answer was a little incorrect. And, again, I think it was posed to him By Mr. Hall -- is that the purpose of a monitoring well is not merely to determine the top or the depth to water, but to determine the entire saturated thickness.

A monitor well program, as proposed by the operator and subject to an E&D Plan, could have a lot of flexibility as we've heard testimony before. They may not have to have a 1500-foot monitoring well. They may need to have one but they might not have to. So at some point, the information gathering aspect of this is addressed by the monitoring program.

They certainly want to know the depth to water. We also like to know the water quality. That would also be part of the monitoring program, but we also want to know the saturated thickness. Because as we learned from Mr. Morrison from the State Engineer's Office, this area is not sufficiently understood by the State Engineer's Office that they feel

comfortable declaring anything other than the entire water column to be protectable in the absence of more specific information.

Q. Do you see the monitor well program as being used to detect fresh water or detect releases or both?

A. I think it could be used for both. I think one of the earliest thing that would be needed in an Exploration and Development Plan is for the operator to get information on the fresh water that is in the area that is covered by the plan. As I mentioned earlier, that could be any possible combination of monitoring points. It could be newly installed monitor wells. It could be sampling the water wells. It could be -- also as we've testified, you can get useful information from the mud logs and the electric logs.

After that is determined, and they're into the production phase, it may become appropriate for those monitor wells to become a monitoring point for a long term monitoring program.

Q. So there's no one-size-fits-all for that?

A. No. And the monitoring program would need to be proposed to us by the operator. They're the ones who know the most about what their Exploration and Development Plan consists of, and they would have to propose to OCD what they thought was appropriate.

This rule does not specify that for each well that

you drill that you have to have a monitor well, but you have to have a monitor program.

Q. Okay. You were here today for Mr. Will Jones' testimony also; is that right?

A. Yes, I was.

Q. And we had discussion of protection of fresh water during his testimony.

A. Yes, I remember that.

Q. Mr. von Gonten, do you serve on the Water Quality Control Commission?

A. Yes. I'm a commissioner designated for Chairman Fesmire.

Q. And so you are familiar with the Water Quality Act as well as the OCD rules on water?

A. I would not say I was an expert on that, but I am familiar with both sets of regulations.

Q. In connection with your work with the OCD, are you familiar with how the Water Quality Act interacts with our jurisdiction?

A. Yes, I am.

Q. Did Mr. Will Jones say anything in his testimony that you would like to comment on?

A. Yes. There were a couple of items that I would think that my testimony was prepared to address. In no particular order, but the one that comes to mind first is the

waste disposal facilities. That would include saltwater disposal facilities. That's one of the items, and I would have to look at the specific rule to see where that is. But it talks about surface or waste management facilities, and that would include your disposition of produced water.

It does not, apparently, have the same -- I'm not familiar with the Otero Mesa rule. I don't know that it's as specific as that rule was, but it would certainly address all waste management issues, and saltwater disposal would be waste -- an oil field waste management issue.

Q. So then if an operator was planning to have its own saltwater disposal wells, that would be something that he would need to include in his plan?

A. Yes.

Q. And that would be something that you would evaluate to make sure that --

A. That would be evaluated at the hearing.

Q. Was there anything else in Mr. Will Jones' testimony that you wanted to address?

A. I would like to just make an observation -- is that the question came up about the identification of fresh water zones. That has always been -- well, not always -- but it's certainly on the OCD forms where operators are required to identify water sands.

Many times they do not -- they -- they're allowed and

unfortunately do not provide that information, even though they may penetrate it. But that kind of information has been required for a very long period of time on standard OCD forms -- and I can't remember if they say which form it is, but there is a column in there in which they will identify the geologic formations that they encountered, and they would also identify any water sands that they encountered.

Q. What does that mean to you?

A. That it has always been important to OCD that water sands be identified and that data be collected and that the water zones would be protected.

Q. Are those two terms interchangeable or do you have a preference as to which is used?

A. I think a lot of these terms are interchangeable. The term was -- could have been an aquifer. But then you get into the definition of an aquifer. In common oil field usage, it's a water sand. Well, it could have been a water-bearing limestone as well. So the intent, as I take it, as I understand it, is that any water-bearing zones would be identified.

Q. Is it relevant how much water is produced from a water-bearing sand?

A. I don't believe so. It's just that that is part of whatever the rule is. I should know what the rule number -- the form number is. It's the identification of it. One

comment came up -- I believe this was Ms. Foster's -- about, you know, basically what we would refer to as a monitor well is first water, and you're drilling with an air rotary rig or a hollow stem monitor, that's commonly how you detect the first water-bearing zone that you encounter.

You may also be doing things like, you know, cores as you go along and you would see the saturation in the core material, but you would also note that when your cuttings start coming up wet. And all throughout environmental programs, the determination of the first water or depth to water and saturated water thickness is extremely important.

Q. Do you recall Mr. Morrison's testimony that the Office of the State Engineer considers -- and I may misstate it, so correct me if I'm wrong -- any water encountered in the Galisteo Basin to be assumed to be protectable?

A. That was my understanding of Mr. Morrison's testimony.

Q. What does that mean? What does that mean in terms of what the OCD needs to do to protect it?

A. Well, the State Engineer's designation is very important to us; I believe we looked at one of the memos from 1985 from the State Engineer's Office to the Division Director or a member of his staff. It means that we have to presume that all the water we encounter is protectable; that is, fresh water.

I mean, they've certainly designated in writing that the 10,000 milligrams/liter TDS concentration is the point at which it's considered to be protectable fresh water. Until we get additional information that would show what depth that horizon that you would get into non-protectable waters, we would presume that the water encountered is going to be protectable. Whether we had water quality information from, let's say a chlorides test or salinity determination, or even in a log analysis.

Q. Now, there are certain provisions in the proposed rules that are designed to help us find out if we've encountered water in drilling; is that right?

A. Yes. Part of it is that information gathering aspect of it that a monitor wells would be useful for. Logs are useful information. The mud log can be very useful information. But that's part of why we have these special provisions is because the water resources in Santa Fe County and the Galisteo Basin are not adequately known according to the State Engineer.

Q. Can the tools that you mentioned help us know whether the water is fresh water or non-protectable water?

A. Yes, they can help you. There's actually some ways of actually determining water quality. Mr. Jones talked about a drill stem test. That would certainly be one way. During the logging program, you could also do a repeat

formation test, which would allow you to collect a few gallons -- if I remember correctly -- of the fluid by pressing a downhole tool against the wall and allowing the fluids to flow into that. You could sample that and determine what the water quality was. You can also do log calculations as well.

Q. If only the tests were done that the rule proposes right now -- the water salinity, the water saturation porosity test, the mud logs -- and no further tests were done on the water, and it was inconclusive whether the water was fresh or not, would the operator simply have to take all precautions to protect fresh water?

A. Yes. In the absence of information that the operator is responsible for collecting, we would assume that it was protectable water.

Q. If the operator wanted to go to the extent of doing additional tests to prove that the water was beyond 10,000 TDS, that would be something the OCD would consider and whether the protective measures were necessary?

A. Yes.

Q. But it would be up to the operator?

A. The operator would have to provide that information.

Q. And if they don't want to, they need to take all the protective measures?

A. That would be true. That's true.

Q. Was there anything else that Mr. Will Jones testified to today that you need to address?

A. Well, I think there are two more items. One, there's been some discussion to what's been referred to as a single well EDP. The language of Rule 39(9)(B) talks about the best estimate. And I would not say that we would exclude consideration of such an EDP, but I think it would be very hard to convince the Hearing Examiners or the Commission that somebody is going into the Galisteo Basin with a one-well prospect given the lack of infrastructure to support that sort of prospect.

And you can drill off that all day long down in the Permian Basin and the San Juan Basin. One-well prospects may be economic, but it would sound to me like it would be an attempt to avoid providing the information that would be put into the public notice, and we think that the public notice is very important so that other interested persons including agencies, both State and federal, would be put on notice that there's an Exploration and Development Program that is going to go on in an area that they're responsible for and that they would have rules and regulations that would apply to that area.

Q. Okay.

A. I think that the single well EDP concept is not something that we could 100 percent exclude, but I think it would be something that is somewhat unlikely. I would be very

skeptical. I think the plan needs to show in good faith an outline on the map that shows where the exploration is planned or development is going to occur and also include the required infrastructure; roads, pipelines, surface waste management facilities. These things are spelled out in the rule.

Q. So on the single-well EDP, are you saying it's possible that that would get past the administrative completeness review, but it would be up to the operator to convince the Hearing Examiner that it truly was a best estimate?

A. Exactly.

Q. What do you consider the requirement for a best estimate of productive area -- well, let me back up.

The Exploration and Development Plan requirement talks about describing the area covered by the plan including at a minimum, the operator's best estimate of the productive area. What does that mean to you?

A. Well, it means that they should actually give us notice of how big a program -- drilling program or development program -- that they're contemplating. I wouldn't quibble with them if they wanted to say that they have mapped a structure and they're going to show 50 percent of that structure and presumably the entire structure would not be productive.

But it's their best estimate. I don't expect to see their supporting seismic and well log interpretations which

they put together for that, but we do want to focus on the surface impact for protection of the environment, but we also want to focus on the saturated thickness of any aquifers or protectable fresh water that we would find underneath that Exploration and Development outline.

If an operator wants to basically tight-hold the Division, then they run the risk of having to come back in and having to get a -- I'm not sure if it's referred to as an amendment -- but they would have to go through the EDP hearing process again before they could continue, because they only have approval for the number of wells that they put down on there.

I would agree that they can be flexible and put in proposed locations, and they don't have to know where they're going to end up in two or three years, but this has to be their best estimate before they kick off their exploration program.

Q. And to the extent they can accurately predict what they want to do, they can avoid having to come back in for amendments?

A. Right. That would be the upside for being forthcoming in the scope of their operations. There were some numbers tossed about that I saw in the newspaper a 100-million-barrel-field. Well, that would be a pretty significant piece of territory.

Q. Is that for the Galisteo Basin?

A. Yes. Doing the numbers for justification for this drilling program. That's an awful round number, but it at least shows that they have more than a single well prospect in mind when they came here. At least that's what Tecton, I believe, was proceeding -- or some release about that.

The more that they can show us up front, the more they can get on with their drilling and production program. They will have -- if it was something that large, they would have to build infrastructures from scratch. There is no existing infrastructure as far as pipelines. The road may not be adequate. Power lines may be necessary, plus there will necessarily be pump stations or transfer stations if there was gas. If it was necessary, they would have a gas pipeline. If it was oil, they could truck it out for a while until they decided it was important enough to get a crude oil pipeline into the region.

So the plan really should be comprehensive, and trying to downplay it so much, you lose some creditability with us. You wouldn't be coming into a rank wildcat area if you didn't think there was some significant upside potential.

Q. Would it be possible for an operator to propose an Exploration and Development Plan that discussed different stages or phases of their operations? For example, you mentioned they might want to truck the oil initially and move to a pipeline later?

A. I think so. What they're talking about is at one point kind of conceptual, but it needs to be based on their best estimate. Obviously, they had to go in front of somebody with some maps and cross sections and discuss these sorts of things.

A discussion came in about economics. I would disagree with Mr. Jones about whether we need economics. Maybe it would be nice to have, but it really wouldn't be something that we could make a decision on because economics vary from company to company.

Q. Those were the economics that the company was running internally on the project?

A. I believe that was what came up in one of the cross-examination questions. Mr. Jones was, I believe, talking about risk factors for drilling. He used the number of 25 percent, which I would agree with him would be a favorable outcome. He talked about Monte Carlo simulation.

But all those things, the detailed economics, we're not interested in. But if they got to the point of discussing economics and presumably offering to provide it to the OCD, I would recommend that we not accept it. But that means they would have to consider all that infrastructure that would have to be built from scratch, because any management team is going to look at and say, "Where's the nearest place I can get my crude oil refined and actually get some money for it?"

If they start looking at that, this all becomes what a frontier area is. You move into frontier areas because of significant upside potential. But you realize that the risk is there and the upfront initial costs are likely to be much greater than being in a developed area such as the San Juan Basin or the Permian Basin.

Q. One of the requirements in the rule is that the operator has a plan for addressing waste. What does that mean to you?

A. Well, it's inevitable with any business venture, that you generate waste, and there's no waste management facility in the Galisteo Basin that I'm aware of. So they're going to have to truck any oil field waste that is generated through drilling -- say, closed-loop system, they're going to have to take that some place and dispose of it.

So they can be as specific as they want, or they can say it will be taken to another OCD-approved facility. But we need to have a commitment that they're going to pick up the waste that is there: Whether it's a 55-gallon drum that they've been using to contain little leaks and spills that have stained a couple cubic feet of soil or, in the closed-loop system, the drying pad, if they were to have one, the content -- if they were going to get an exception -- all the waste that is there would have to be addressed, and primarily it doesn't have to be specific about what you're going to do

about it. But it would have to be a commitment that the waste will be collected and stored appropriately.

Q. Does waste include produced water?

A. Yes, it does. And I was talking about that earlier. Certainly this term does include produced water and at some point, they're going to have to have some sort of disposal of the produced water that they would be separating at the well site.

Q. And would you expect to see their plan for having produced water in the Exploration and Development Plan?

A. Yes.

Q. That's part of the waste plan?

A. Yes. Although I would certainly agree that if the Commission wanted to change that language to be more specific such as it is for the Otero Mesa area, that would be something the OCD would support.

Q. We talked about the contingency plan earlier when we were discussing Brad Jones' testimony. One of the requirements for the contingency plan is best management practices for the prevention and detection of their leaks. Can you explain what is requested in that?

A. Well, as OCD has put out in its guidance, this is actually a plan that people should follow, the operator should follow, that actually prevents releases in the first place. It's much easier to have a plan that prevents releases than

actually have a plan for remediating releases. It's far less expensive to have an ounce of prevention.

And that is what we're wanting people to do is put something together that perhaps changes the corporate culture; perhaps changes the culture of, "Well, I just dumped a quart of transmission fluid on the ground. I can kick a little dirt on it and move on."

We want it to be in writing so also there is the thought process that has been engaged in this: "Now, how do we actually go about doing this? What can we do to actually make sure that we don't have this?"

I kind of think of it as being a health and safety plan for the infrastructure just as you would have a health and safety plan for the people that are actually in there. Its intent is not really to be overly burdensome but it's to put people on notice that spills and releases are going to be inevitable. They will happen. You should try to minimize them to the extent possible with pollution prevention in the first place. And then also the contingency plan would come in and say, "If you have a spill, unfortunately, this is what you do to address it."

Q. Are such plans common in the industry?

A. You know, that would probably be something -- we do not require that; we encourage it; we put it out in our guidance. For example, health and safety plans are required by

OSHA; we don't require it. I would suspect -- although I don't know. I'm speculating now -- I would suspect that a lot of the better drilling contractors have something in effect. They can actually get in your way when you're trying to go on site until you jump through all their health and safety rules and also put on the appropriate coveralls and make sure that you have hearing protection, eyeglasses and so on and that you're aware of any sort of flags that are flying.

I think the people who are going to be that rigorous would probably also be rigorous about having a pollution prevention program in place. But, again, I don't know that. I'm speculating. But I am afraid that some operators will not have that.

Q. You had mentioned that there were several items in Mr. Will Jones' testimony that you wanted to address. Have we addressed all of the items that you wanted to address?

A. I don't know that he actually answered this question directly, but I think Ms. Foster asked him about -- or she made the comment that she thought that this plan would apply only to exploration.

I would say that OCD's position is that it definitely applies to exploration and development. It's the -- exploration is a few number of wells. You have a discovery well, a compilation well, and at some point you say you're no longer in the exploration phase; you're in the development

phase. And that's where likely if this was to be a productive basin, a new discovery, it's like that during the production process, this plan needs to be in place most of all. That's when you're going to have the infrastructure being built and installed, the tank batteries, the pipelines, all the other things that are necessary to get the natural resource to market.

Q. Is there anything else in Mr. Will Jones' testimony that you wanted to address?

A. I don't believe so.

Q. Did you prepare written testimony describing the requirements in photographs 1 through 8 with the exception of the drilling program and the mud logging program?

A. I did.

Q. And is that OCD Exhibit 4?

A. It is.

Q. Have you reviewed your written testimony?

A. Yes, I have.

Q. And do you accept it today under oath?

A. I do.

MS. MACQUESTEN: I would move for the admission of OCD Exhibit 4.

CHAIRMAN FESMIRE: Mr. Hall?

MR. HALL: No objection.

CHAIRMAN FESMIRE: Ms. Foster?

MS. FOSTER: No objection.

CHAIRMAN FESMIRE: Exhibit 4 will be admitted.

[Applicant's Exhibit 4 admitted into evidence.]

MS. MACQUESTEN: No more questions on direct.

CHAIRMAN FESMIRE: Mr. Hall, do you have a cross for this witness?

MR. HALL: A couple.

CROSS-EXAMINATION

By Mr. Hall:

Q. Mr. von Gonten, for the operators who will not have had the pressure of sitting through this hearing for the last few days, when they look at the rule as proposed itself, they won't be able to tell what the Division is expecting them to supply consistent with your testimony here today. Would you agree?

A. Well, the rule -- it does not specify, let's say, for example, what a contingency plan must have. I do think that operators generally have access to consultants who do put things like this together. The hydrogeology and geology reports, that's routinely done by environmental consultants.

I don't think it is -- it is not carved in stone exactly with a checklist of everything that must be in there, but, again, this goes along with the line of best estimate. There may be some questions that people have, and they can certainly ask the Division and call in and ask questions about

this.

Q. So you would agree with Mr. Jones, Mr. Will Jones', testimony that it's preferable to have some flexibility in the application of rules?

A. I do agree with that, generally speaking.

Q. Would you be willing to provide us with simpler or a template of an acceptable E&D Plan so that the industry can take a look at it and give you what you need?

A. I don't really have a firm opinion on that. That would have to be a question posed to the Division management to decide whether we were going to undertake that effort. We have done so for the Pit Rule for certain parts of it. So I assume that at some point, when the rule is finalized, there might necessarily need to be some outreach training. And in which case, that would be something that might be very useful.

Q. Let's work our way through the rule proposal. First, let me ask you: Did you draft the rule proposal?

A. I did not. I was involved, I would say, about four or five times during the drafting of it from the initial outreach last winter. I was involved with the drafting -- I was asked to do a technical review of the report and also provide some proposed language on parts of the report. I did do a technical review of it -- and I'm speaking now of the Galisteo Basin Report.

As a result of that, there was another executive

order, and I sat down with Ms. MacQuesten, who was the principal drafter of the rule, and she asked me some questions, and we started talking about what special provisions would be appropriate, and I was involved in some discussions and made some suggestions at that point.

At a later date, I did have an opportunity to do a technical review and to pose any sort of changes to the draft. And then I did author this testimony, Exhibit 4.

Q. Let's see if we can get a better understanding of what might constitute an acceptable E&D Plan according to you, and let's pick up with some of the commercial definitions in the rule under 9(B). You briefly touched on your preferences for operator best estimates of conductive area under 9(B)(2), and you may have sat through some of the earlier testimony on this.

Again, is the Division looking for an estimate of the productive limits of a common source of supply such as the Division uses for its nomenclature in pool rules?

A. Sir, I have to tell you that I'm not familiar with that nomenclature.

Q. You're not familiar with the Division's pool rules and how that works?

A. No. I'm in the Environmental Bureau, and we don't get into that.

Q. And it sounds like you're going to regard single

well E&D Plans for, say, science project wells with some skepticism?

A. That would be my inclination.

Q. And you are aware there are some of those wells drilling right now in this State, are you not?

A. I was not aware of that. I believe you mentioned the Tularosa Basin.

Q. Tucumcari.

A. Tucumcari. No, I'm not familiar with those.

CHAIRMAN FESMIRE: Mr. Hall, I'm not familiar with that concept either. Could you enlighten us just a little bit on what it is? What is a science project well?

MR. HALL: How about a single well that's probably 30 miles from the next closest well. It's a single well plan.

CHAIRMAN FESMIRE: You mean an absolute rank wildcat?

MR. HALL: Pretty wildcat.

Q. (By Mr. Hall): When the operator provides you with supporting materials for its best estimate of the productive area, do you know whether the Division has any provisions to protect the confidentiality of any of that data?

A. No. And I think that, in fact, that's contrary to one of the major intents of this proposed rule is to go to public notice. One of the primary requirements is that all other interested persons be put on notice.

So if you have, say, an outline of your best

estimate, and let's just say it's 5,000 acres -- not that that's the 50 percentile or 100 percentile -- but for the purposes of getting an approved plan, you put down inside these 5,000 acres is where we propose to explore.

And then later on you put your proposed well locations with a little tank battery off to one side and, you know, potentially dash in a proposed pipeline route. This is something that the OCD will look at. And I think it's been clearly testified to that we do not have the authority to go in and deal with threatened or endangered species the way the BLM does -- or archaeological sites.

That isn't our -- we're not given that authority under the Oil and Gas Act. But other agencies do have that as their responsibility so they're put on notice that here's a substantial piece of the Galisteo Basin that's going to potentially have significant oil and gas development. And, therefore, they may have some obligations under their own statutes and their own regulations to get involved with this.

Q. As I understand the rule as written, when you're asking for the operator to submit its best estimate, it can be supported by any data at all; is that accurate?

A. That is true. We're not asking for maps and cross sections that depict the play. The structure of the prospect, we would consider that to be something that we do not need to have to meet our goal of providing people -- other

people are interested in the surface impact. We are also interest in the surface impact, but also with the impact of potentially in the third dimension of protecting fresh water which may go -- the testimony I've heard, it may go 1500 feet to 2,000 feet in some areas. So we do think of the third dimension, but we are not requiring something you would show to sell the prospect in Houston or Dallas.

Q. So you're interested at a minimum in having a description of the horizontal extent of the E&D Plan area?

A. That's true. But it also has to include your potential -- I forget the exact term -- but target zone or zones. So that would be the third dimension as well. I notice that is information that isn't required on the APD, but it is required -- it is reported on other forms. So that may be one of those things that would be an exercise in making our forms consistent.

It seems that you would want to have that information -- OCD would want to have that information for the APD. Later on they require -- and I forget for which form it is -- maybe it's for the allowable -- I don't remember.

Q. Okay. So it's important for you to know the vertical extent as well?

A. That's right. And in context with we're not interested in whether something at 8,000 feet is productive or not. We're very interested in 8,000 feet if it actually is

still fresh water and protectable at 8,000 feet. And I don't think that any of the other agencies would have any interest in really the subsurface. And we're interested in the subsurface primarily for the protection of fresh water.

Q. I understand. Okay. But describing the, quote, "productive area" does have certain ramifications as we convert from an approved E&D Plan area to a special pool, wouldn't you agree?

A. Yes. I think that it -- certainly, I would expect that if exploration was successful, it's highly unlikely that the company won't learn something during its exploration program that changes -- that would require a change to the ED Plan. And probably even some changes when you finally go to the special pool orders.

So assuming that you don't have perfect vision up front and that every drop of oil that you predicted to be there was actually there and that you didn't encounter some bonus zones, so I think there could be -- we talked about flexibility, but at some point there may be substantial changes that would require an amended or resubmitted ED Plan.

Q. So you anticipate another review process including a hearing when we convert to special pool rules?

A. I believe -- this was not something I testified on -- and I believe Ms. MacQuesten made a statement earlier in an objection that the rules provide that there may be a hearing

when we go to special pool orders. I don't think it's mandatory.

Q. Who decides that?

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

Q. If you would look at 9(B)(5)(a), that addresses notification. But is it the Division's intent that E&D Plans would be required for all types of ownership; State, federal, private and tribal?

A. It would be required for State and federal because we regulate the operators. I don't know the answer about tribal.

Q. Private?

A. Private, yes, it would be. And, you know, with the tribes, you get into sovereign issues that I don't know the answer to that.

Q. Then in subparagraph 5 you discuss -- or the rule discusses what you'd like to see in the mapping of the area. Let me ask you for unsurveyed areas such as land grants, what would be satisfactory to the Division in terms of delineating the boundaries of the E&D planning area? How do you do that?

A. Well, I think you would have had to already have that information before you started to drill because you have mineral leases. I would assume that there would be a legal description on those mineral leases that tells you that you have a right to drill there in the first place.

The land grants -- the grants are not in a township, section, range, but they do have a legal description of some sort. Whatever a surveyor comes up with or the patent or whatever the document is you go find at the courthouse is adequate.

This is not necessarily -- we're not interested at this point, Mr. Hall, in, you know, to a centimeter accuracy. That's not the intent. The intent is that when we do public notice, that we're able to describe this area so that people who are interested in it know what we're talking about because you told us where it is -- or your client, the operator.

Q. So if your E&D planning area is contained within the inner boundaries of a land grant, would GPS coordinates of the owners or the courses suffice?

A. I don't think so. I think that those would suffice for -- let's call the infrastructure such as the wells and things like that. But we want the legal description so that somebody looking at it will say, "I know where this is. This is something I care about. This is something that we've already got an archaeological site on, or there's a threatened or endangered species, or there's a wildlife corridor."

That could certainly be supplemental information that could be provided at the same time. I know that's very easy to obtain nowadays. But we're looking for that thing that's on the deed or the patent that described it. That way, you know,

somebody -- you know, you might also be able to say that it's 5,000 acres in the southeast corner of this land grant.

Q. Okay. Or would you find the use of imputed or projected township, sections, acceptable?

A. I would have to -- I don't know the answer to that. I see that it is done. I've seen some wells that actually had township, section, range on them and had some people come in and ask me about them, and when you look at it, it's just not there. We have a database that has a little well site locater that you plug in the township, section, range and the corner calls and it doesn't have the information on that. Because you're extrapolating an irregular grid, and you're extrapolating in a perfect grid fashion, and therefore it's not accurate.

Q. By more than a mile in some cases, right?

A. I wouldn't be surprised.

CHAIRMAN FESMIRE: It's much more than a mile.

Q. (By Mr. Hall): You're also for -- at Subparagraph 5(E), Locations of Water Courses. Is there a definition for water courses that you're relying on?

A. I believe we do have water courses defined in our rule book.

Q. Is that one of your exhibits?

A. I don't think we have the entire rule book as an exhibit.

MS. MACQUESTEN: Actually, Exhibit 29 covers a couple of terms that have been used in this proceeding.

THE WITNESS: I would also point out that it is in the new section of the citation. It is 19.15.1(W)(8), NMAC.

MS. MACQUESTEN: 19.15.2.7?

THE WITNESS: No. That would be the old one. I'm looking at the one I printed out yesterday.

MR. HALL: Are you using outdated rules?

Q. (By Mr. Hall): I only want to establish which definition we're relying on.

A. The real answer that it is in our definitions.

Q. You're relying on the Division's definition of a water course?

A. Yes.

Q. Okay. Do you know if any well head protection areas exist in the Galisteo Basin or Santa Fe County?

A. As I understand the term, that would be the area surrounding the water wells that we saw depicted, and, again, I would defer to the definition which is 200 feet from a private domestic fresh water well or spring or within 1,000 feet, horizontal feet, of any other fresh water well or spring. So that also is as defined in our regulations, Mr. Hall.

Q. Okay. It needn't necessarily be designated by the Water Quality Control Commission or State Engineer's Office to qualify?

A. No. They are covered by our regulations. Certainly, it's referred to in the Surface Waste Management Facility Rule and in the Pit Rule.

Q. If we look at your testimony, Exhibit 5, when you discussed some of the information you'd like under Rule 9(B)(5) for your mapping, you say do this because you want to evaluate the sensitivity of a particular site. What does that mean, "sensitivity"?

A. Environmental sensitivity. We have a general provision or requirement to protect human health and the environment, and in particular, we would be looking at things like that water course feature that we were requiring specifically to be depicted on a map.

And I would also point out that with our recent Pit Rule, which would -- if you were to drill out here with a closed-loop system or get an exemption for the Pit Rule, that would also be something that you would have to consider setbacks for.

Q. Okay. And you discuss setbacks on page 3 of your testimony about line 115. That would be part of the Division's review and approval process be to dictate appropriate setbacks; is that accurate to say?

A. What it really is -- we do not have in our regulations a specified setback for a well to be from say, a barn or a house or anything else. We don't have that in our

regulations. We do have setback requirements for pits and closed-loop systems. So in that respect, since you're presumably going to have your wellhead very close to where you're going to have your pits, we do have a setback requirement.

Q. Okay. But we're not using pits here, right?

A. That's correct.

Q. So what would be the criteria the Division would apply to determine appropriate setbacks from, for instance, playas and spring channels?

A. Well, since you will have something to have your drilling fluids in, that would probably be covered under the Pit Rule, which also covers closed-loop. So that would be something you would tell us, and then we would look and see how the Pit Rule applies.

Q. And if you're using closed-loop with tanks, the operator could rely on the provisions in current Rule 17 to determine siting sufficiency?

A. I would assume so, yes.

Q. Okay. When you say the Division wants to determine setbacks, it's not just for well locations; is that correct?

A. That's right. That would be part of the overall exploration and development footprint that we're interested in. And that's why we're requiring that the operator submit maps

and plans that would show the infrastructure or the proposed or potential infrastructure.

Q. So do you contemplate that the Division might have specific requirements in its approvals to tell the operator where to locate tank batteries, pipelines, access roads?

A. I think we would. And one of our other requirements here -- perhaps you'll get to it -- but we're wanting people to reduce their footprint similar -- in the Galisteo Basin -- similar to what the BLM might require. So we want someone to have a thoughtful analysis of how many roads they might have to have, how many well pads they would have to have.

Because they actually, potentially, develop their reserves from a pad that is centralized and will have directional wells drilled from it, the size and spacing of those well pads, the tank battery placement and the pipelines, obviously, minimizing the linear impact to the environment by these pipelines. That should be considered. I don't think that we're going to have a hard and fast answer, but by requiring the operator to consider it and put it in their application, then we have a starting point to see if there's some way of improving it to where other people or other agencies who might have some concerns with the proposed pipeline or road.

Q. All right. And, in fact, on page 4 of your testimony you refer to making submittals along the line of what the BLM requires pursuant to its Gold Book procedures. Is that what the Division has in mind here?

A. I think that's a good starting place for people to do. They may be even more protective. As some testimony has kind of dealt with this issue, we do not in the Division have that authority to deal with, say, restoration in necessarily the same way or threatened and endangered species or really this whole thing that BLM does have special authority that Congress granted or imposed on BLM. We don't have that, so other agencies have that authority to deal with these things.

Q. So would you be satisfied to see an operator provide you with an APD and supporting materials sufficient to satisfy the BLM's requirements for its APDs?

A. It might very well. I wouldn't commit to saying that that's all, that we won't come up with something else that the BLM doesn't require. BLM doesn't have the special requirement for the protection of groundwater which is a major function of the Environmental Bureau and the OCD. They're more surface focused as far as restoration and protection of, you know, scarring and damage to the environment.

Q. Okay. One more question about the setbacks. Will the Division take into consideration the provisions of

lease terms or SOPA agreements that have prescribed locations of surface infrastructure already?

A. I think we would take it into consideration. I don't know that I would say that those things would rule, that they would trump our authority or our other -- you know, we have our issues and what's covered by the Surface Owners Protection Act is not really our business. So we're still going to have protection of human health and the environment regardless of what some landowner has agreed to with an operator.

Q. Some landowner. So the OCD feels it has the authority to override private agreements?

A. Sure. If they were going to come in and say that you can dump all your oil field waste into this ditch in the back of my house, we're going to say, no, you can't.

Q. Have you ever seen an agreement that says that?

A. I have not.

Q. Me either.

A. I haven't seen a single SOPA.

Q. Let's look at your testimony on page 3 in your Exhibit 4. At 96, what you're asking Alfredo's to provide there, you're asking for a hydrologic and site report. Is that one report or two?

A. I think they could be combined.

Q. You want to evaluate the effect of development

on, among other things, soils. What sort of information are you looking for there?

A. Well, the site report might address the soil information, and you might have a soil horizon in your particular location or some part of it that might be particularly susceptible to erosion, for example, that might come out in review of this report, and it might become important to OCD that that be addressed. Or it might become important to another agency.

Again, this is foundation information. It's a general report that's prepared for the area that will be covered by the plan. And, you know, it's basically a literature research. We are not proposing that anybody go out and do a field mapping exercise. You might have to go out and do an archeological survey according to somebody else's rules, but we're not requiring a field mapping, a geological field mapping exercise.

Q. I see. And if we look at page 3 of your testimony about line 127, as I understand what you say, you're asking for the reports to be based on available data and other reports. Can you tell us what databases are acceptable to the Division these days?

A. Well, certainly it's been mentioned many times -- I think iWATERS is an excellent source to get to. There is the problem that some older wells may have been installed and

drilled before the basin was declared are not in the iWATERS database.

You might have to make a trip to the State Engineer's Offices to get those driller logs or any other information that was available. But certainly the State Engineer's office is a major source. The USGS. Mr. Morrison based a lot of his testimony on two USGS reports, if I remember correctly. That would certainly be acceptable.

The Bureau of Geology and Minerals -- or whatever their title is nowadays -- those kind of reports are excellent sources of information.

Q. So you're looking for a literature search and database searches. You want that packaged and presented to you?

A. Yes.

Q. Okay.

A. And I would say that this is, you know, something that is usual and customary that is provided to the OCD during any sort of environmental investigation. We're not looking particularly for more than that. Some reports are better than others, certainly.

Q. Let's talk about proposal Rule 9(B)(7). You're asking in your proposed plans and, in fact, on page 3 of your testimony at the bottom of the page, you're asking for quote, "several plans," and one is a plan for a monitor well. We

discussed that briefly earlier. When an operator looks at this rule for the first time and it just says give us a plan for a monitor well, could you elaborate for us and give us an example of what you'd like to see?

A. Well, it's not just a monitor well. I would start off by saying it's a monitoring program. If you're going to come in and say you have a hypothetical, 5,000-acre ED Plan, then you may have to propose several monitor wells. This is the part in which I think we're flexible.

I think the plan should be reasonably specific. But, for example, we're interested in something that you can actually determine, as we say, the depth to water, saturated thickness, baseline water samples, and later on, perhaps after the exploration or development well is completed, to perhaps monitor it for releases.

We could consider other monitor points such as a water well. We're not thrilled about water wells as being monitoring wells, but they might suffice for the depths of water and the saturated thickness and so on. It might include actually screening several different levels. You might have to have clustered wells. It depends on the scope of the area.

When we look at it, you may find that your target zones are de-coupled from the groundwater -- fresh water aquifers -- that we're seeking to preserve. So they can actually not correspond one-to-one to each other. In other

words, what might be off structure and presumably not as much interest to the operator may be into an area that is saturated alluvium.

So we would be interested in knowing how you propose to gather the information to answer these questions to fill in that data gap as well as potentially monitor for releases.

Q. So there's no requirement that a monitor well be drilled in each and every circumstance?

A. There probably will be a requirement that there will be a monitor program. Again, I'll just reiterate that while you may not have to put a monitor well in, if you're in an area that coincidentally has pretty good information -- that's where you chose to explore -- and you have adequate information, and you can actually say, "Look, here's the depth to water map and here's the water quality of it, and we know the saturated thickness. We were just lucky."

We may not require a well be installed for that purpose; we may require a well for long term monitoring purposes.

Q. Mandatory to capture some baseline water samples?

A. Yes, we would want that. I don't think that you -- well, certainly if you're going to have a monitor -- if your well is being used for long term monitoring, we have to compare it against the baseline sample.

And I always recommend to people that the more

background samples they can collect, the better off they are in the long term. But you can build what I call statistical variance by sampling, say, quarterly or even more frequently. If you just want to hang your hat on one, I don't recommend that people base background on a single sample because of the natural variation and the water quality.

Q. And an operator would have to know exactly what we are monitoring. Is it the Division's intention to monitor individual production wells?

A. It could be. I'll hedge a little bit on that and say that we need to see what your overall plan is and make our determination of what we need based on the size of your operations.

And also it may be the comments of some other people. We would expect as a result of public notice that somebody will come out and say, "They gave you a map that depicted all the water wells on it, and my three water wells aren't on there."

Well, they may not be in there, despite the fact the operator made a good-faith effort to get that information from the State Engineer's Office. The State Engineer may not have that information and the landowners may not be providing that to the State Engineer.

So we will have to consider during that hearing process all information before we can come up and make a final recommendation and determination. I would think the Hearing

Examiners would want to do that -- and the Commission. And if the Environmental Bureau would find that they are either in support of or in opposition to, or say we think it's great, but they need to make these changes -- that kind of information will have to be determined on a site-specific basis.

CHAIRMAN FESMIRE: Mr. Hall, would this be a good place to break?

MR. HALL: I just have one more question.

CHAIRMAN FESMIRE: Is that all you've got?

MR. HALL: No.

CHAIRMAN FESMIRE: Okay. One more question and then we'll take a break.

Q. (By Mr. Hall): Again, so it's conceivable that the monitoring plan could cover an area immediately adjacent to a producing well or encompass the entirety of the E&D Plan area?

A. Yes, sir.

Q. Wouldn't it be helpful for the operator to know which you would like when it makes its application?

A. Well, again, that depends on the scale of their operations and their proposed plan. Again, we do want to be flexible, but we do have a real need to -- I wouldn't call this a data-gathering exercise -- but that information is really necessary for us to have to be able to protect fresh water.

Certain areas, you know, it has been testified, is

simpler geology. We know the depth of water; we know the saturation in the alluvial aquifers; we know where the Ogallala is; you know, we know the other water sources, the fresh water. So we have a pretty good handle on that.

There's also a lot of reports that have been generated by either the State, you know, the State Bureau of Geology or the USGS. Here's an area where I made a fair effort during the outreach proceedings to go and get familiar with the hydrogeology of the area, and I didn't feel like I grasped it. And I understand from Mr. Morrison's testimony now why that is.

Q. Okay. Can we assume that we're not thinking about monitoring plans as you would require for a remediation program? You don't need that?

A. That is correct. This is not a program with the goal of detecting, say, hazardous waste being released from a hazardous waste surface or hazardous waste landfill. It is not that scope.

And, in fact, I would just observe that at some point, it might be satisfactory to the Division that the well could be plugged and abandoned once we've got sufficient information out of it to determine it -- if we decided that it has to become a long term monitoring well, then we're not talking about that.

It may be turned over to the landowner. We might want it to be plugged and abandoned so there's no potential for

direct communication to the aquifer; there's no vandalism.

Q. Okay. And among the three stated purposes for requiring a monitoring plan, the last is to detect releases. And my question is: Releases of what?

CHAIRMAN FESMIRE: It's a good thing you're a better lawyer than you are a counter. Go ahead and answer the question.

THE WITNESS: That is included in there as one of the purposes of the monitoring program. As I said, not every well necessarily would have to be a monitor well -- I mean, would have that as its purpose to detect releases. But at that point it does begin to resemble an investigation or remediation program.

Q. (By Mr. Hall): But we're limiting our consideration to releases of hydrocarbons; is that correct?

A. Well, any subsurface fluids. It could be produced -- water, produced water from -- that would be released through perhaps, you know, people speculated that hydraulic fracturing might be a pathway for this. I have no opinion on whether that's likely or not.

But, for example, if there was a release through the fracture, that might be detected by a properly situated monitor well.

MR. HALL: Thank you.

CHAIRMAN FESMIRE: Mr. Hall, I understand you still

have some additional questions for this witness?

MR. HALL: Yes.

CHAIRMAN FESMIRE: We're going to take a quick break, stand up and stretch, and Commissioner Olson is going to get his calendar.

When we come back, we'll take public comment. Please make sure if you intend to give public comment, that you are signed in and have indicated that you want to give public comment.

And then when we get done with public comment, we will continue this hearing, and we'll decide then exactly when we'll continue it to.

[Recess taken from 4:28 p.m. to 4:37 p.m., and testimony continued as follows:]

CHAIRMAN FESMIRE: Let's go back on the record. At this time, we will reconvene Case No. 14255. The record should reflect that all three Commissioners are present and a quorum is present.

We have asked those who would like to comment now please indicate so on the sign-in sheet. I have four people who want to comment. I have one person who has to be up at the Roundhouse by five o'clock and would like to go first. Is that acceptable to everybody?

Johnny?

MR. MICOU: I forgot to write my name on there that I

want to comment.

CHAIRMAN FESMIRE: I have five people who want to comment.

MS. TRUCKER: Six. I don't think I put my name, Amy.

CHAIRMAN FESMIRE: Okay.

MR. KRAMER: Is Richard Kramer on? It's on the list. I just added it.

CHAIRMAN FESMIRE: Okay. Well, we're going to get started, and we're going to stay with the folks who signed in first, and then we're going to on from there.

Mr. Byers, you were first?

MR. BYERS: Thank you, Mr. Chairman, members of the Commission. My name is George Byers.

CHAIRMAN FESMIRE: Mr. Byers, before you start, we have two ways of doing this: One is to just give a statement where you won't be questioned; the other one is to be sworn in to give testimony where you do have the potential to be cross-examined. Do you have a preference?

MR. BYERS: I just have a statement. I just want to -- I will say I have been involved with natural resource development in New Mexico since 1976: Coal development, railroad construction for -- between coal, mines, and power plants, isotope separation and now uranium exploration and development.

And I would like to speak in objection to this. I

think doing what you're proposing or what is being considered on a county-by-county basis or on a basin basis is really at the edge of a slippery slope. There's probably no telling where it might lead. It's the "camel's nose under the tent" for who knows how much regulation. You've got proven technology and capable regulators in this State, and all of us whose job it is to produce things from the ground, to turn on lights, to help us move things, and to move ourselves around, to the clothes we wear -- everything in this room came from the ground somehow.

You're going to make it extremely difficult. This State has got serious financial problems already. They're getting worse. If you go to a county-by-county and basin-by-basin basis on this, where might it stop? Are you going to do solid waste transfer stations or water treatment plants on a county-by-county basis for one reason or another? Ultimately, it could lead to that. I think the only winners may be the legal profession, and the rest of us will be doing our best to support them.

I think it's very dangerous, and the economy of this State is slowing down fast. Something like this could stop it faster than that poor cow stopped the Rail Runner yesterday. That's my statement, Mr. Chairman.

CHAIRMAN FESMIRE: Thank you, Mr. Myers. Marita Noon?

MS. NOON: I have no time limit, and if someone has to leave, they're welcome to go first.

CHAIRMAN FESMIRE: Is there anybody else that needs to leave? It looks like we're here for the duration, ma'am. Go ahead.

MS. NOON: My name is Marita Noon, and I'm the executive director at CARE, Citizens Alliance for Responsible Energy, and I thank you, Mr. Chairman and Commissioners, for giving me this opportunity to share with you my thoughts and my opinions on this particular matter.

As I mentioned, I'm the executive director of CARE, so as I stand before you here, I stand before you not just as myself and not just as a single voice, but I'm representing nearly 1,000 citizen members of our organizations who in the four short years this organization has been in existence have entrusted me to speak on their behalf. And these are citizens who have chosen to join this organization because they believe strongly in the right of abundant, affordable and available energy. So that's the background from which I speak to you today.

I'm here to oppose these new regulations. I believe that they are overreaching; that they go beyond the Commission's authority; that this is something that should be determined by the legislature; that, in fact, is why there is a bill that is being introduced in the legislature for this next

session that will give the legislature authority over these overreaching decisions. I feel that these actions go against the will of the people.

Now, you have more people in this room today who are opposed to this -- excuse me -- who are for this particular regulation and this process. However, when you look at the Statewide opinions of New Mexicans in energy -- and my organization did a poll which I have right here; it's available on our website; anyone can look at it if you would like -- we did a Statewide poll of New Mexicans' attitudes towards energy and the vast majority of people in this State favor a strong energy industry in this State, realizing that it impacts the price of gas at the pump and realizing it impacts national security, et cetera.

Now, if this rule was only about Santa Fe, which it appears to be at the moment, but those of us who follow these things know that it's really not just about Santa Fe, that it has a much wider and a much broader implication, I guess, is the right word; that it's part of a larger plan to demonize the oil and gas production in America, and that it's not just about Santa Fe.

Now, you may think I'm some kind of whack job in coming up with this. I'm kind of out there playing; however, the proponents of this increased regulation, some of whom are in this room, are involved in other organizations such as the

executive director for Common Ground, an organization who, if you study their website, their goal is to demonize oil and gas production in America. That's a part of a larger group which is called Earthworks. Their website states the same thing. And Earthworks now has finally acknowledged a plan that many of us have been tracking for a long time, and the plan is called "No Dirty Energy." It evolved from a plan called "No Dirty Oil and Gas." They've been denying this for a couple of years as I've been tracking it. Just earlier this year, Earthworks claimed that they have launched officially this plan called "No Dirty Energy."

They aim to make the regulations that are in this State nationwide and as Mr. Jones stated earlier today, he even stated, "I prefer statewide rules."

So while what we're supposedly talking about here in Santa Fe County, his comments were, "I prefer Statewide rules."

Now, additionally, I had a conversation out here in the hallway today with some of the people who support this regulation. And as we began talking, the conversation quickly led to a ranting conversation about how we must get off of fossil fuels because fossil fuels are killing the planet.

Now, you see if this is just about drilling in Galisteo Basin, I believe that's an issue that we can resolve. Amy and I had a very pleasant conversation during the break earlier today. But this is not really about just drilling in

Galisteo Basin because the plan is much bigger, including the comment: "We must get off fossil fuels because it is killing the planet."

And it's these very regulations that have chased business out of the State. As Mr. Byers mentioned, this State is in serious economic trouble. We have historically in this State, while we are 43rd in the nation in per capita personal income, we have historically in this State enjoyed a surplus of funds. However, the policies -- many of them that come from this organization -- the policies have chased business out of the State.

It was mentioned earlier today that Tecton Energy now has their properties up for sale. They have chosen to leave the State because the policies here are such that it makes it too difficult to do business in the State.

In the San Juan Basin, Key Energy, one of the world's largest oil service companies, pulled their pressure pumping service out of the San Juan Basin because the Pit Rule made it so difficult to do business, they moved their equipment to Midland, Texas, hurting the New Mexico economy and New Mexico jobs.

The well count in the San Juan Basin is now down 60 percent due to regulations that make oil and gas production in this State just onerous, just harder and hard. And this is one more layer on that particular process.

Everywhere else -- not everywhere else in the country, but including here. Amy and I were talking earlier about the film industry as my husband is involved and their ranch is involved in the film industry. This State has spent a lot of money -- and I don't have documented numbers with me -- but this State has spent a lot of money trying to attract business to this State. We did that with Eclipse Aviation. We lost a lot of money on all of these ventures. The oil and gas industry and the uranium industry which I know is not the issue, but which I address as well -- have the potential to bring money here without costing the State money. And yet the State continues to chase these industries out of the State.

New Mexico is already at the bottom of the chart in nearly every statistic, and regulations such as this will only push New Mexico into an irretrievable abyss. Earlier when Ms. Spears said, "Without water, we are all going to be moving," I agree with that. Without water, we're all going to be moving.

But you know what? Without a strong economy, every one of us except for the extremely wealthy are going to have to be moving because we aren't going to be able to afford to live here even if we have water. We will not be able to afford housing; we will not be able to afford electricity; we will not be able to afford to drive our cars; we will not be able to afford to buy clothes; so yes, water is important.

We can have water, but if we have no economy, the water does us little good. She also mentioned that there are wells going dry and wells that have bad water. I live in a rural community myself. I live on a large tract of land, and I have a well on my land. There is no oil and gas or production anywhere near my land. But you know what? The well on my land is bad. The water that comes out of the well on my land is not worth a darn thing.

I have water trucked in every five weeks. Yesterday the big truck backed down my driveway that my husband snow-blowed so the big truck could get down my driveway and deliver 4,000 gallons of water into my tank.

So there's other reasons why a well might be bad. Certainly there's no oil and gas production anywhere near where I live, and my well is bad. We in this State have abundant resources that regulations like these that we're talking about here today make those resources unavailable and therefore unaffordable and disproportionately hurt New Mexico's large, poor population.

And I hope that you will take this into consideration as you evaluate this proposed rule.

Thank you for listening.

CHAIRMAN FESMIRE: Thank you, Ms. Byers. Mr. Clemma?

MR. CLEMMA: My name is John Clemma. I'm a recent resident to Santa Fe. I moved back to the U.S. after 40 years

overseas. I'm a geologist, exploration geologist by profession, company director, many public companies around the world which I've mostly gotten off the boards of and a couple of small ones. I come here not knowing quite the right protocols, but I'm truly amazed.

I've had the pleasure over many years of negotiating deals in various countries in Southeast Asia and Australia in all levels of government. Frankly, I think you guys have got it backwards. If there's a problem, the Department of Environment should be saying what the deal is. I think it's a terrible idea that companies that want to take risks here and invest money have to prove their innocence first with all sorts of jumping at shallows. It might be this. It might be that. With all these lawyers in the room, I'm just amazed that nobody says that there's some sort of equality in that.

Nothing has been done wrong by these people or -- as near as I can figure out -- by anybody else. Yet last year or the year before, I was at a meeting here where one of the people from the environment stood up and said, "Well, we haven't given any permits, but" blah-blah-blah and we've permitted you to pollute.

Well, that philosophy, of course, I oppose. I believe that as a human being on this planet, whether I evolved naturally or that God put me here, I do what I do as a human being, and that everything that you see has been invented by

us, by us people, for our use, for our benefit, and is natural, is correct. And there are some things that we can do better.

And I can remember testifying in front of the Senate Committee back in 1972 in Missoula of all places, about the Clean Air Act. We have way passed most of these things. We are way into the law of diminishing returns that set in some time ago. We're wasting people's lives and time and intellectual capital arguing about how many angels can dance on the head of a pin or could or should.

The first thing that we need to do is to decide what the regulations are and just giving a government department the ability to decide who's going to come up and be able to do this or that is absolutely wrong, absolutely.

As a tax payer, I'll attack it from another direction. I want to know if you implement this, I really want to know how it's going to make it better -- not just people feeling better. How many jobs are you going to take away from, say, the Department of the Environment because they won't be needed. Why not do the simple things, like perhaps if somebody wants to do something, ask them for a bond and say, "Here's what we expect."

You've got a house of cards here that is falling in on us. We see this economically around the world. We are not liked overseas. We are viewed as liars. We're stupid. That's one of the reasons I came back. I got tired of defending the

indefensible.

I only hope that you can do this and start working backwards, as it were, to get the resources flowing here, to get some profits into this State, let those of us who can do something do something, and work together rather than singularly -- and I'll look forward to these other gentlemen who have gotten their instructions as to what they have to say before I leave -- but please, please, do not allow this to happen. This micro-breaking up as was previously said: This county, that county. It's bad enough just with the difference in the State regulations. What I'm asking you to do perhaps in part, is to fire yourselves.

Thank you.

CHAIRMAN FESMIRE: Mr. Droz? Is Mr. Droz in the room? I'm sorry. I apologize. I read that wrong.

MR. DROZ: You don't mind if I sit down?

CHAIRMAN FESMIRE: Not at all, sir.

MR. DROZ: Also, if you don't mind, I would like to do something a little new. I don't mind being sworn in and taking any questions.

CHAIRMAN FESMIRE: Okay. Will you raise your right hand, please?

MR. DROZ

after having been first duly sworn under oath,

was questioned and testified as follows:

THE WITNESS: Mr. Chairman, members of the Commission, my name is Matthew Droz. I am an attorney with the law firm of Baker Botts, and I'm here today representing Halliburton Energy Services Incorporated.

I wish to take a moment just to respond to several comments that have been made both today and in the earlier days that this hearing began. Specifically, I'd like to address comments that have requested that the proposed rule require disclosure of chemicals, and more specifically, frac fluid, hydraulic fracture fluid.

Halliburton agrees with the State Minerals and Natural Resources, as well as with the OCD, that no such disclosures are necessary. The reason for that -- there's two reasons for that: First of all, there is little or no risk -- and that's a term I'm borrowing from the EPA. Second, adequate disclosures already exist.

Getting to the little or no risk thought, Mr. Jones the second, Will, I thought he did a very good job of explaining the science that keeps contamination or limits the risk of contamination, and he described some of the engineering protocols, the casing and cementing jobs. He described some of the geological processes and zone of isolation as well as some of the flow-back methods and operational methods that essentially create little or no risk of any contamination underground.

He also commended -- this caught me a little off guard -- Halliburton and Schlumberger for their strict adherence to safety. I agree with them. I think Halliburton does a good job of adhering to safety regulations, and I think that limits any risk of contamination. I also think that your proposed rule moving away from pits will further reduce the risk of surface contamination. And with the risk of contamination essentially eliminated, the need for disclosure also seems to become eliminated.

However, there are existing federal regulations that do require disclosures. We heard a very heartfelt testimony today earlier today claiming that frac fluids and other fluids are completely exempted from federal regulation and disclosure. That's not true. There are several regulations that do require disclosure. Just to mention a couple of them, the Emergency Planning and Community Right to Know Act, also known as EPCRA, also known as Title 3, does require specific disclosures.

Halliburton is regulated by EPCRA, and as such, it must submit on an annual basis specific chemical information to local emergency planning committees, the State emergency response commission and to local fire departments throughout the State.

The information that is required to be disclosed through EPCRA is significant. You must disclose chemical names, physical hazards associated with such chemicals, OSHA

permissible exposure limits, health hazards associated with the chemicals, including signs and symptoms of the exposure, emergency and first-aid procedures, an estimate of the maximum amount of chemicals present in the facility, a description of the manner in which these chemicals are stored and the location of the chemicals at the facility.

In the unlikely event that a reportable quantity of any hazardous chemical is released or spilled, EPCRA requires the immediate notification of local, state and federal officials.

Another applicable regulation is OSHA's hazardous communications standards. An emergency medical situation -- and this is a topic of much misunderstanding -- in emergency medical situations, OSHA's hazardous communication, HAZCOM, requires all companies, including oil and gas service companies such as Halliburton, to immediately disclose -- in quotes, "specific chemical identity" to a treating physician or nurse regardless of whether the product is protected as a trade secret.

Despite allegations to the contrary, there are no exceptions to this requirement and trade secret chemical constituents are not exempted from this disclosure. It is not my intention today to exhaustively list all of the federal disclosure requirements, but simply to point out three things: One, robust federal disclosure requirements exist. Two,

companies like Halliburton and other service providers must comply with those obligations. And, three, State and local officials are the recipients of this information as required to be disclosed.

In conclusion, let me just reiterate that sufficient disclosure requirements exist. They are in place to protect both human health and the environment. As such, Halliburton agrees with OCD that no additional disclosure requirements should be included in today's proposed amendments to the State Oil and Gas Rules.

I appreciate your time. If there are questions, I would love to attempt to address them. If not, I can certainly take them back to the people who know and try to get you an answer.

CHAIRMAN FESMIRE: Ms. MacQuesten, do you have any questions of this witness?

MS. MACQUESTEN: No questions. Thank you.

CHAIRMAN FESMIRE: Mr. Hall?

MR. HALL: No questions.

CHAIRMAN FESMIRE: Ms. Foster?

MS. FOSTER: No questions.

CHAIRMAN FESMIRE: Commissioner?

COMMISSIONER BAILEY: Yes. Are you familiar with the Leaf case?

THE WITNESS: I'm not. Is that here in New Mexico?

COMMISSIONER BAILEY: No. That was in Alabama, having to do with the potential contamination of frac fluids for drinking water.

THE WITNESS: I am familiar with most of the allegations that have occurred recently. I think I have heard the case that you're discussing, and it was one that not many people are speaking about and talking about right now, so I don't know all the facts and allegations in that situation. But I am aware of various other allegations of contamination.

CHAIRMAN FESMIRE: Commissioner Olson?

COMMISSIONER OLSON: Well, just following up on that, what can you say about some of these other cases of reported contamination from frac fluids?

THE WITNESS: What I can is say two things: EPA, other studies, have concluded that there is -- no case has been concluded or determined through investigation in which the hydraulic fracturing process has contaminated an underground source of drinking waters.

That is not to say there haven't been surface spills. That is not to say that surface spills have not contaminated water. That is an issue.

We and other service providers attempt to operate safely and when there is an unintended release, it is addressed immediately; proper officials are notified; it's cleaned up and responded to appropriately. But as far as underground

contaminations, every case that I've looked at, every case that I've read about, every study I've read, has concluded that the process itself, hydraulically fracturing a natural gas well, has not contaminated a source of drinking water.

COMMISSIONER OLSON: That's all I have.

CHAIRMAN FESMIRE: Mr. Droz, I appreciate what you said, especially about the Pit Rule. But you understand that there are some companies -- not all -- but some companies in New Mexico are vehemently opposing the Pit Rule right now.

They fight local regulations and specific rules for local entities saying that the rules should be Statewide and that the State should make, you know, definitive rules for the State, and they point to the pit -- to the OCD rules as the reason.

The OCD rules are becoming more effective. They're becoming stronger. And yet at the same time, they're appealing those rules. And then, you know, I was pleasantly surprised to hear what you have to say about the Pit Rule. That's not the industry -- that's not some of the industry opinion in New Mexico.

THE WITNESS: And, well, I guess what I'm saying with the Pit Rule, it's not the Pit Rule specifically, it's the use of closed-system tanks that has reduced some environmental risks. That's not to say it eliminates all risks. It can cause other problems. I can certainly see why members of

industry would be opposed to that, because every sort of correction leads to other problems.

And so I'm not here to endorse that, but simply to say I understand that it does have at least some benefits while at the same time it may have additional drawbacks. So I don't want to come across as endorsing the Pit Rule, but simply to say if what you propose is enacted, it does eliminate at least one risk.

CHAIRMAN FESMIRE: Thank you very much, Mr. Droz. I appreciate it.

Mr. Micou, I guess you're next.

MR. MICOU: This will be public comment. Mr. Chair, Commission, I'm here representing Drilling Santa Fe, which has 1,350 concerned citizens participating, and they're mostly in Santa Fe County.

I'm also here as the executive director of Common Ground United. We have over 30 members. Half of those members are nonprofit. Some of those are national. Some are local. We also have -- the other half are businesses, local businesses. And why would they join up with us? Because they're concerned that oil and gas moving to Santa Fe County would adversely affect their business because of the kind of economy we have here.

As we move from an era of etiology to one of pragmatism, I'd like to address the issue about the following

rig count numbers I keep hearing in the press. The rig count must be taken into context of contango versus normal backwardization. And those are -- I'm not going to get into detail on those. Those are talking about spot oil and futures contracts.

Oil prices are dropping. There is a hoarding of oil futures for higher prices, plus OPEC slashed historically output. Likely prices will go lower short term given the short speculating position. But they will reverse and go higher given credence to the lack of supply. In the meantime, drilling programs will pull back. Thus, the lack of drilling and drilling permits are due to market forces and not due to regulations such as the Pit Rule or the rules that you're looking at here in Santa Fe County and the Galisteo basin.

Once prices are higher, drilling will begin again and will be willing to speculate in exploratory areas. That would also depend on a line of credit, which I would like to add is created by regulation. Thank you.

CHAIRMAN FESMIRE: Amy, I guess you're batting cleanup.

MS. TRUCKER: I'm batting cleanup?

CHAIRMAN FESMIRE: Yes.

MS. TRUCKER: Good. I'm going to be brief and pleasant. My name is Amy Trucker. I live in Galisteo. I love the Galisteo Basin, and that's why I'm here to support, of

course, anything that can help to regulate but not to shut down oil and gas development.

I think today, just being around you guys and listening -- I do try to be pleasant. That's really important to me, and I wish we all could be a little bit more pleasant in everything we're doing here. But I think that I learned so much in listening to your questions and how the questions could actually help the regulations and maybe clean them up a little bit and clear up some questions.

I really think that you're wonderful, Ms. MacQuesten, in what you wrote, and I completely support the regulations and everything that you guys are doing. I know you got to do what you guys are doing.

CHAIRMAN FESMIRE: Thank you. Is there anybody else who would like to make a comment? Sir?

MR. KRAMER: I suppose I can just give you a statement. I've lived in Santa Fe County for the last eight years. I was asked to come and speak to you about the issue that Mr. Droz also just raised because I'm -- I have a lot of expertise in the area of predicting biological effects from chemical structures. I'll just hold it at that.

I have chemistry degrees from Harvard and MIT. The methods I've created are used by pharmaceutical companies everywhere in the world, and I've spent the last 20 years as the chief scientist for the leading company in the field. So

we work for farm companies, of course, the oil and gas, I don't know much about that. So I got on the web, and I started looking, since I was being asked.

And certainly Mr. Droz' remarks come as quite a surprise when you've spent your time trolling around the web. You can to go any site you want, you can look up, you know, just type in the obvious things, and everybody says that every chemical used is a secret, it's a trade secret. You can't talk about it. It's a trade secret, and it's valuable stuff, and we can't tell you.

Well, it's very hard for me to see how that can be consonant with the maintenance of public health issues. If you don't know what the stuff is, how can you or anybody else tell me whether it's safe or not? There are alternatives, certainly, and again, I'll go to the pharmaceutical industry to look for examples. The pharmaceutical industry is all about putting chemicals into people's bodies, and it's a highly regulated sort of enterprise. And sometimes you don't know what the stuff is you're putting into people's bodies.

But in general, for example, you have to do all sorts of things to ensure -- and I've prepared a list -- and I understand you can't have the list because I haven't circulated it to your opponents -- but this is what you have to do. You have to fully disclose everything you can.

The IP issue exists, of course, in the pharmaceutical

industry as well. They have to deal with it in the context of full disclosure. They simply file patents. That's the way IP is protected. It's not usually done by trade secrets. If you don't have anything valuable enough to merit a patent, why in the world are you trying to keep a secret from the public?

I don't understand. I don't understand how this is in the public's interest or anybody's interest. You have to share reproducibility, if you can make the same stuff the same way before it goes into people's bodies. You have to worry about the formulation.

In my understanding, the way the chemicals are handled at the moment is they're basically supplied by third parties and the oil and gas companies in turn buy this stuff from people who are primarily economically driven. They aren't in the position to do the kind of safety precautions. Let me list the safety precautions that we in the drug industry must undergo simply before they put a chemical in a man for the first time.

They have to do acute toxicity in two species. They have to do subacute toxicity which involved dosing a single species for six months. In some cases, they have to do chronic toxicity for two years. They have to show effect on reproductive performance. They have to test for carcinogenicity, and they have to test for immunities.

As far as I can tell from trolling around the web,

the only tests that are occasionally done on the additives that you're putting on oil and gas here is acute toxicity against certain kinds of aquatic species and only some of the time.

I'm surprised by what Mr. Droz has to say, but it certainly seems like it's not practice, whatever the principle may be. So I'll conclude my remarks there. Thank you. What Mr. Droz says is a surprise to me. It doesn't fit the context of everything else I've been reading and everywhere else.

CHAIRMAN FESMIRE: Thank you very much, Mr. Kramer. Anyone else?

MS. NOON: May I make one more comment?

CHAIRMAN FESMIRE: Sure.

MS. NOON: In response to his comments? Marita Noon from CARE.

I just want to comment on the propriety issue. Simple thing: How many people know the formula to Coca-Cola? I mean, it's like -- my understanding is it's one person or maybe two, and they're not allowed to go on the same plane together because they're the only people who know the formula to Coca-Cola.

MR. KRAMER: I think the human toxicity of Coca-Cola is well-established.

MS. NOON: Also, I had a privilege of touring the National Enrichment Center for the Uranium Enrichment last Friday. And I was amazed as they toured me through that how

nobody knows the entire process. There's a certain amount of people who know how to make the centrifuges. And then there are people who know how to assemble them. Then there are people who know how to operate them. But no one person knows the entire process. And that's for security reasons.

So that's proprietary information as well, that nobody knows -- no one person knows how to do the entire process. That's all.

CHAIRMAN FESMIRE: Thank you, ma'am. Okay. At this time, we are going to continue this case until the regularly scheduled OCC meeting on January 15. It will be one of several cases on the docket, and it may need to be continued from that point. But it will be continued from now until in the 15th.

I want to remind the attorneys that we are going to ask for findings of fact and conclusions of law at the end. We're going to ask you to present proposed rewrites to the rule the way you think the evidence supported it and should be addressed.

MS. FOSTER: Chairman Fesmire, when would you be asking for the supported findings?

CHAIRMAN FESMIRE: At the end of the hearing.

MS. FOSTER: At the conclusion of the last witnesses' testimony?

CHAIRMAN FESMIRE: Yes. Within two weeks after that.

MS. FOSTER: Thank you.

CHAIRMAN FESMIRE: The way I understand it, you still have not identified any rebuttal witnesses, Mr. Hall?

MR. HALL: Not yet.

CHAIRMAN FESMIRE: Okay. Ms. Foster?

MS. FOSTER: I have not either, but I should know within the next couple of days and when I find out, I will notify all parties.

CHAIRMAN FESMIRE: Okay. It's my understanding we have Mr. Jones' testimony to complete and Mr. von Gonten's testimony to complete, and there are no other primary witnesses after that?

MS. MACQUESTEN: That's right.

CHAIRMAN FESMIRE: With that, we will adjourn this hearing until January 15, 9:00 a.m., in this room for the regularly scheduled OCC meeting. Thank you all.

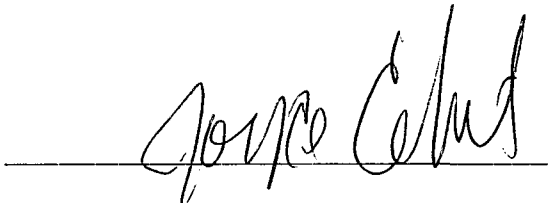
* * *

REPORTER'S CERTIFICATE

I, JOYCE D. CALVERT, Provisional Court Reporter for the State of New Mexico, 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 and was reduced to printed form under my direct supervision.

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 proceeding.

DATED this 18th day of December, 2008.



JOYCE D. CALVERT
New Mexico P-03
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STATE OF NEW MEXICO)
)
COUNTY OF BERNALILLO)

I, JOYCE D. CALVERT, a New Mexico Provisional Reporter, working under the direction and direct supervision of Paul Baca, New Mexico CCR License Number 112, hereby certify that I reported the attached proceedings; that pages numbered 1-244 inclusive, are a true and correct transcript of my stenographic notes. On the date I reported these proceedings, I was the holder of Provisional License Number P-03.

Dated at Albuquerque, New Mexico, 18th day of December, 2008.

Joyce D. Calvert
Provisional License #P-03
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