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:	
APPLICATION OF THE NEW MEXICO OIL CONSERVATION DIVISION FOR REPEAL OF EXISTING RULE 50 CONCERNING PITS AND BELOW GRADE TANKS AND ADOPTION OF A NEW RULE GOVERNING PITS, BELOW GRADE TANKS, CLOSED LOOP SYSTEMS AND OTHER ALTERNATIVE METHODS TO THE FOREGOING, AND AMENDING OTHER RULES TO MAKE CONFORMING CHANGES; STATEWIDE	CASE NO. 14,015

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

COMMISSION HEARING

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

Volume XVII - December 7th, 2007

Santa Fe, New Mexico

This matter came on for hearing before the Oil Conservation Commission, MARK E. FESMIRE, Chairman, on Friday, December 7th, 2007, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South Saint Francis Drive, Room 102, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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C U M U L A T I V E I N D E X

Monday, October 22nd, 2007 (Volume I)
Commission Hearing
CASE NO. 14,015

(Continued...)

PUBLIC COMMENTS (Continued):

DIVISION WITNESSES (Resumed):

(Continued...)

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Tuesday, November 6th, 2007 (Volume III)
Commission Hearing
CASE NO. 14,015

(Continued...)

(Continued...)

DIVISION WITNESSES (Continued):

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(Continued...)

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(Continued...)

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Tuesday, November 13th, 2007 (Volume VII)
Commission Hearing
CASE NO. 14,015

(Continued...)

(Continued...)

PUBLIC COMMENTS:

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Wednesday, November 14th, 2007 (Volume VIII)
Commission Hearing
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Thursday, November 15th, 2007 (Volume IX)
Commission Hearing
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Friday, November 16th, 2007 (Volume X)
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Friday, November 30th, 2007 (Volume XIII)
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Monday, December 3rd, 2007 (Volume XIV)
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Thursday, December 6th, 2007 (Volume XVI)
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A P P E A R A N C E S

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* * *

ALSO PRESENT:

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* * *

WHEREUPON, the following proceedings were had at 9:04 a.m.:

CHAIRMAN FESMIRE: Let's go on the record.

This is a continuation of Cause Number 14,015, the Application of the Oil Conservation Division for repeal of existing Rule 50 concerning pits and below grade tanks and adoption of a new rule governing pits, below grade tanks, closed loop systems and other alternative methods to the foregoing, and amending those -- other rules to conform to the changes; statewide.

It is nine o'clock a.m. -- I keep wanting to say Sunday, December 7th, but it is Friday, December 7th, 2007.

The record should reflect that Commissioners Bailey, Olson and Fesmire are all present, that the Commission therefore has a quorum.

And pursuant to prior agreement from counsel, Dr. Thomas has come back to finish his cross-examination, and I believe were at the point that Commissioner Olson was going to question Dr. Thomas.

MR. HISER: That is correct, Mr. Chairman.

CHAIRMAN FESMIRE: Commissioner Olson, why don't you go ahead and continue?

COMMISSIONER OLSON: Okay, let me figure out what we're -- where I was in a lot of this here.

MR. HISER: This would be Exhibit 8 --

COMMISSIONER OLSON: Right.

MR. HISER: -- Dr. Thomas.

COMMISSIONER OLSON: And for a start I think I might go to your attachment A. It's actually in Exhibit 9.

MR. HISER: If I may approach -- ?

CHAIRMAN FESMIRE: You may, sir.

BEN THOMAS, PhD (Resumed),

the witness herein, having been previously duly sworn upon his oath, was examined and testified as follows:

EXAMINATION

BY COMMISSIONER OLSON:

Q. And I'm seeing you're using the NMED soil screening levels. You've got listed SSL 4, version 4.

But I guess I'm trying to understand what you're using here. You said that these are soil screening levels for a DAF of 100?

A. No, these should be -- they should be the residential soil screening levels. Are we looking at the right table? Attachment A.

Q. I'm looking at Attachment A, that's correct.

And is that for exposure for direct ingestion, I'm assuming?

A. Basically that's correct.

Q. All right.

A. That tends to be the most conservative of the

human exposure criteria for solids.

Q. Maybe you can refresh my memory, because I've slept since you did this.

Where are your soil screening levels for migration to groundwater?

A. They are not here.

Q. Why not?

A. Primarily, this was considered to be a solid, and the -- as the solids are dried and things like that, initially the thought was that the residential soil screening level would be the appropriate criterion.

Q. But I thought you were talking about that you were looking at the overall risk of these materials, so the risk that you looked at is just looking at direct ingestion --

A. No --

Q. -- of --

A. -- no, it's not summarized in the table. We actually looked at the leachate concentrations relative to MCLs, other types of things, you know, where there was an MCL there was a -- you know, we could compare directly to that. If there was a -- data from other states, we would compare it to that.

Q. You have to bear with me because I thought I saw a slide you had in here where you talked about using a

migration path to groundwater with a DAF greater than 100.

A. I don't think so, but -- We considered migration to groundwater, but we were using primarily criteria for -- we were looking directly at the leachate concentration relative to things like a drinking water standard, okay? And in general, we didn't consider that it would be further diluted and attenuated.

MR. HISER: Commissioner Olson, you may be thinking of one of his slides towards the last four or five of his presentations. That might be what --

Q. (By Commissioner Olson) Right, because I'm looking at one slide here, and there's no numbers on these, it just says 3103 Constituents, and then it says, Groundwater is unlikely to be of concern given dilution and attenuation processes, then in parentheses it says DAF greater than 100.

A. Right, the DAF greater than 100 was from Dan Stephens' report and modeling. Like I said, it wasn't something we assumed in our risk evaluation. What we did is, we took the leachate concentrations and assumed that somebody was actually going to drink that leachate. Okay?

What I'm saying here is that even with that assumption, we didn't see anything that gave us concern, and groundwater is unlikely to be of concern because there is, in fact, further dilution and attenuation, and I cited

Dan Stephens' estimate of a DAF greater than 100.

Q. Well, are you aware that the Environment Department does not use a DAF greater than 100 in a standard setting? They use either a DAF of 1 or a DAF of 20?

A. Yeah, and again, I didn't use it either.

Q. Okay.

A. I'm just citing Dan Stephens' suggestion that this is something that he believes is an average DAF for New Mexico.

Q. But you're making the conclusion here that groundwater is unlikely to be of concern given dilution and attenuation processes with a DAF greater than 100?

A. That's right.

Q. But a DAF of 100 is not accepted by --

A. No --

Q. -- you're -- you seem --

A. -- it's still --

Q. -- to be using the Environment Department --

A. -- it's not a concern, directly ingestion -- direct ingestion, and it's not a concern -- even less of a concern because of further dilution and attenuation.

Q. I guess what I'm getting at is, you're accounting for a lot more in your conclusions here, a lot more -- at least that's just what this says here, by using DAF greater

than 100.

A. I'm not quite sure -- Could you repeat your point?

Q. Well, you have a pathway analysis that uses a DAF of 100 that's in writing here. I mean, you're saying -- you -- I guess I'm hearing two different things. You're saying you didn't use it, but then in here, in your written testimony, it's saying you are using a DAF of 100 -- greater than 100 to --

A. Yeah --

Q. -- base your conclusions --

A. -- yeah, it would have been more accurate just simply to delete the parentheses?

Q. To what?

A. It would be more accurate just to delete that parentheses.

Q. So you're saying that you based yours on the leachate generated from a TCLP analysis; is that what you're -- were using?

A. We looked at those concentrations, and none of the concentrations that I'm seeing are giving me concern.

Q. And that's concerns based in the leachate from a TCLP analysis?

A. Where we had that kind of data, that's right.

Q. And are you aware that the TCLP is not used for

determining -- in New Mexico, as far as I'm aware, has never been used for determining potential exposure? It's used solely for determining waste classification and the disposal of materials as a hazardous waste?

A. Yeah, that doesn't surprise me. You know, the TCLP analysis was developed for that purpose, of course. And what's happened over the years since EPA developed that is that there's a greater appreciation, among toxicologists at least, that it's the soluble portions of the metals and the soluble chemicals that are of primary concern in terms of bioavailability and environmental migration.

So when I take a look at the analytical methods that I can use to evaluate that soluble component, I had water -- or I had acidified water, either a TCLP- or an SPLP-type procedure. I chose the one that is the most severe, and that is the TCLP. It's a little bit more severe than the SPLP-type procedure, and both of them are more severe than just plain water.

And so I wanted to maximize the likelihood that if there is something that's soluble we're going to get it out, analyze it and identify it as -- so that we can discuss it here.

Q. Well, I --

A. And so it is -- You're correct that traditional use of TCLP is, in fact, for waste characterization. I

chose to use it as just simply the most health-conservative way to identify the soluble constituents.

Q. Well, I agree it will tell you what's soluble based -- in terms of classification for whether something is a hazardous waste. But just because the TCLP analysis is below the standard does not mean it's not going to get into the groundwater to cause an exceedence of the standard.

So I've seen this used numerous times on oilfield sites, especially for benzene. And if you use the TCLP analysis, according to that theory you would never see groundwater contamination from petroleum spills out in the oilfield.

And I guess do you have any -- at least, you know, that's my experience with it. I've seen folks try to use it numerous times, and it's -- they'll say the TCLP is below that level. We'll have them do investigations, and it shows there's groundwater contamination in excess of the standard. So how is that? How does that occur?

A. Well, you know, I think what you're doing is, you're approaching this from the regulatory point of view. You know, I use the regulatory criteria simply as a way to identify which constituents you need to focus on. Okay? And as I mentioned before, a lot of times the details of the characteristics of a site present unique problems and

unique solutions.

But for practical purposes, the criteria are a good way just to screen the data that you have collected, determine which ones are of regulatory concern, which ones are not. Okay? And then you start to evaluate, well, what do we know about this and what does it really mean?

My intent was not to really look at whether or not we meet or exceed or -- you know, regulatory criteria here. What I was really trying to do was get an understanding of what chemicals are out there, in what form, so that I can start to evaluate it from a risk perspective as to whether this is something that needs to be dealt with so that the risk can be vindicated.

So I just -- I used these criteria, and they -- you know, as tier 1 criteria they are the first screen, the most health-conservative screening number that the regulatory agencies submit. Okay? And as you know, in the Environmental Department the next step are perhaps going to a more site-specific tier 2 sort of analysis and -- or a very site-specific tier 3 analysis where those number no longer apply, but the site-specific numbers start to apply.

So I'm just using it as a real quick screen. I want to make sure that we identify what chemicals are there, what forms they are. Are they soluble? And if so, let's do a quick screen to determine which ones are likely

to be of regulatory concern and therefore need to be moved forward in the risk-evaluation process.

Q. But in the screening that is done through the New Mexico Environment Department, the work is on totals; it's not based upon SPLP or TCLP --

A. That is true.

Q. -- it's on totals.

A. And that is -- that is the old traditional way of dealing with regulatory things with regard to this.

And if you take a look at how EPA methods are run, they use a very strong acid to dissolve the mineral content in terms of the metal analysis, for example. Very strong acids dissolve the actual soil particles so that anything that's there is now solubilized and can be run through the analytical procedure. Okay?

And that was the old style, when EPA first got started. That's really the approach that they took. Anything and everything, let's get it all out and see what the worst case is.

Well, from the toxicology and the health point of view, more and more of the regulatory agencies are starting to recognize that it's not the total. Okay? Barium sulfate is not a health problem. It is the soluble portion of barium sulfate, if there is one, that would cause any kind of toxicity.

So they started to develop extraction procedures. Okay? SPLP, TCLP. They started to say, Well, in fact, these are the things that are environmentally mobile, these are the things that could migrate down to groundwater. And from the health perspective, these are the things that are likely to be absorbed in the GI tract.

And so as a result, all I'm doing here, I'm just simply saying, I know what NMED does, and I know that the approach that they're using is a traditional approach. I'm just saying that in the regulatory arena, I think that there are changes that are happening where they're focusing now on more of the soluble portion, not the total, because the total actually has very little relevance, I think, in terms of protecting health.

Q. But I guess at this point here you're asking us to accept an approach that's not accepted in New Mexico.

A. No, I'm just describing what I've done, because all I can do -- all I can do, really, is the best that I can do. Okay? And from the technical viewpoint, I think the approach that we took was a reasonable approach. It was designed to identify what chemicals are present, what form they were, so that we could evaluate whether there's a real health risk or an environmental risk, and we can now start to deal with that. Okay? It is not designed to be a regulatory-compliant demonstration.

Q. But that's what we do. We have regulations based for regulatory compliance in New Mexico, and you are not using the approach that is used for regulatory compliance in New Mexico. Is that correct?

A. Well, I think that I am. I mean, we are analyzing total and we are comparing that to the SSL, which as far as I know is what NMED requires, okay, as their tier 1 criterion -- procedure. We are looking at the water-soluble portions of it, evaluating whether they are likely to pose risks to groundwater, you know, which again is in theory the concept that NMED follows.

So I -- you know, I hear what you're saying that -- you know, use totals. But I'm just saying that for my purposes, and the best technical advice that I can give my client, I decided that we need to do something to look at the soluble portion of these metals, and TCLP was as good a method as I could come up with from the available methods that are approved by EPA.

Q. Well, are you using that as well for the soluble portion of -- you know, of the BTEX, then, as well?

A. No, BTEX is run there. I was looking at total content of benzene, primarily, okay? So, you know, if the total is -- there are a number of different ways to look at it. But essentially I was a little less concerned -- once I saw the total levels, I was less concerned about soluble

levels. Okay?

As I mentioned, benzene was seen to be high in the soil, in the solids, in one pit, and all the samples were diluted a thousand times in order to do the analysis. And it appears they were diluted because of other constituents in that same sample that required dilution.

But those particular samples were very different than the samples that were diluted at lower concentrations or dilution factors. Okay?

So when I -- at the end of the day, I decided that benzene should be mentioned here so that we can give full consideration to it with all the caveats, but I'm not convinced that it truly is a chemical concern in the samples that we saw.

Q. Well, I agree, it's at lower concentrations from the samples that we've seen, and I think even from -- a lot of the samples from OCD samples as well.

A. Yeah, I consider the OCD test program to show the same thing that the industry group test program did.

Q. Well, I guess I still come down to the idea that you're basing the leaching on the TCLP method, which is not accepted by the Department. So you're -- I just see this whole comparison to EPA -- New Mexico Environment Department methods, and you're not following methods that they employed.

A. Well, I mean, does NMED have a preferred method for determining soluble constituents? I'm sorry, I'm not aware of it.

Q. Well, what's being looked at is looking at defining the profile, and you're just doing this based upon a theory of what's going to be migrating. So the Department does not accept just the theory of where things are going to end up; you look at the actual real-world data -- I think that's what's been talked about here a lot, about real-world data, about where things actually migrate to.

So the theory is one application, but still a theory has to be demonstrated with actual data. And then I guess --

A. Yeah.

Q. -- there's -- there's -- I think I've seen some here that was done with electrical conductivity that you had done last week. I guess what other data has -- have you got any other data to look at the mobility of these metals from some of these old pits?

A. The answer is no.

Q. Okay.

A. Yeah. You know, I'm listening to what you're saying and I'm thinking to myself that the NMED approach makes the assumption that we have a DAF of 1 or a DAF of

20, you know, that sort of assumption in there, and I -- I'm not sure that my method is any worse than the assumptions that NMED is using.

Q. And I guess is that site that you looked at last week, is that the only, I guess, real-world site that's been looked at so far for a former --

A. I'm not sure which site you're talking about.

Q. It looked like the site that Mr. Wurtz presented the other day.

CHAIRMAN FESMIRE: Douthit site, is the way he identified it. The Douthit site.

THE WITNESS: You know, I've not been to any of these sites, so I don't know, because I'm -- I don't really go out in the field very much anymore. Okay?

But what I did have was the analytical results of the samples that were collected. I had the work plan and so on.

Q. (By Commissioner Olson) So you weren't actually out at that site, you just looked at the data that they collected?

A. That's correct.

Q. Oh, okay, I was misunderstanding. I thought you were out there, so...

A. No, I'm sorry, I don't go out in the field very much anymore. I'm more dangerous that way than...

MR. HISER: If it would please the Commission, Dr. Thomas has not seen actually at all the site that Mr. Wurtz presented --

THE WITNESS: Yeah, I've seen --

MR. HISER: -- his testimony --

THE WITNESS: -- photographs --

COMMISSIONER OLSON: Oh, okay, I thought he said that he worked with Dr. Thomas on --

MR. HISER: He said he worked with Dr. Buchanan.

COMMISSIONER OLSON: Dr. Buchanan, oh, excuse me. Okay, okay.

Q. (By Commissioner Olson) And you're doing your -- it seems like what you're basing your conclusions on here -- and I don't know, maybe Mr. Brooks talked about this, I don't know if I remember what it was. Your conclusions are based upon the average concentrations; is that --

A. That's correct.

Q. -- what you saw?

Don't you typically look at the highest concentrations for worst-case scenario?

A. It depends. If you take a look at the risk assessment guidelines for Superfund from the EPA, and I think also NMED guidelines for compliance really are an average. It's not the worst-case approach.

The -- You know, as you think about a site with

contamination and find the contamination is not consistent, the same concentration everywhere -- and as I mentioned in my testimony, the EPA approach was to assume that somebody in the contaminated area will go from one area to the next. Okay? He won't spend all his time at the site of maximum contamination every day for 30 years, eating that dirt at that concentration. Okay? He will in fact move over here where it's a little less, over here, and so on.

And so the EPA guideline is, you take a look now at the average of the concentrations seen in the impact and so on. Okay?

And I've done the same sort of thing with the same sort of reasoning, that yes, there were 11 estimates or 11 samples that were collected for a pit, that they will see variability because of analytical methodology variability. They will see differences in just the actual physical concentrations and the lack of homogeneity among the pit contents and things like that.

But if I were to try to give an estimate of likely exposure, it would be the average of all the samples that were collected, not the worst one.

From a regulatory point of view --

Q. And that's for direct ingestion, right? I think I understand that, but I was assuming, then, that you're looking at the same concept of using averages for

contaminant migration in the vadose zone, then, as well.

A. No.

Q. Okay. So you're looking at -- you are using the highest concentrations that you observed, or --

A. No, it would be, again, the -- if I had to consider what the source concentration is, it is in fact the average of all the samples that were collected.

But I'm not doing any modeling here, I'm just doing a real quick, easy screen against regulatory criteria from whatever source I can find, or common judgment, you know, that --

Q. But from what I understand again, just to make sure I got this correct, then, your risk analysis is based upon just direct ingestion of the soils? I'm confused, I guess.

A. Well, if I --

Q. Because you're making --

A. Let me try to --

Q. -- other places you're making broad conclusions in this document, besides just ingestion of soils.

A. Well, let me go back through the key elements of the testimony I gave.

One is that there was -- there were questions raised about what is in the pits. Okay? And so the industry group developed an entire program to go out and

evaluate it, as did OCD. Okay? And so analytical data were collected, you know, and it was not just solids, it was also soluble, and in our case we used the TCLP-type procedure.

Now once we had that, we had a number of chemicals that were not detected at all. We had some chemicals that were detected, but at levels that were so low that the best the laboratory could do was just estimate the concentration. And we had some that were detected at levels that were above the quantitation limit of the methods that were used. Okay? So our -- were now taken.

And in order to determine, well, what chemicals are really there, we now had identified the chemicals. And on my tables you'll see that if it was ever detected in any sample, in any pit, that constituent is now listed on the table, so that we now understand this is a detected chemical.

The next question is, well, are the levels that we found high enough to be of concern? Should we deal with this and focus on this as an issue with regard to pit strategy. Okay?

And in order to do that, we did initial screening against the NMED criteria. If there were no NMED criteria, we tried to find criteria from other agencies that are --

Q. That's for direct ingestion of soil, you're

talking about now?

A. Primarily it is.

Q. Okay.

A. Primarily, because most of the data we have are total.

Q. Okay.

A. Okay? And so, you know, looking at that we now identified which ones should be moved forward as issues of concern, okay?, or potential concern.

And as you heard me talk about in my testimony, direct testimony, it was that we had TPH, we had the chloride, and we had possibly benzene. Okay? Those are the three that popped up from this initial screening activity.

Q. Well, there's also lots of metals and other things that were --

A. Yeah, but they were insoluble, or that they were just -- just -- you know, essentially they were not really of health concern. The only ones that showed up were arsenic, and I -- as I recall, it was the arsenic was the one that popped up. Okay?

But when we looked at the TCLP, everything was nondetect. Arsenic was there, but it's not in a form that's soluble, even in a slight -- in an acid -- acidified water.

Q. Okay, and you're -- yeah, you're basing that on your metal solubility from the TCLP for -- at least for getting the groundwater. Otherwise, you're --

A. Right.

Q. -- you compared your totals to the NMED screening levels for direct ingestion, residential --

A. That's right.

Q. -- ingestion, right?

But I guess then -- I think you heard a lot of our testimony here that, you know, one of the major issues is the migration of chloride.

A. Yes.

Q. And so you understand that they've come up with two different modeling scenarios? One where the Division has 5000 milligrams per kilogram, I guess, or milligrams per liter, of leachate from a soil, versus 3500 from the industry committee?

A. That's my understanding.

Q. And I've been confused by some industry witnesses that seemed to say that, While we did this work and it shows 3500, we'll accept the OCD's number of 5000.

So you're basing your recommendations on the number that's developed by industry, that this is the most appropriate number, 3500?

A. Well, two comments. One is that it is the salt

that is the primary concern that I see with regard to pits. Okay? I don't like chloride because it's a less direct measure than, say, sodium or some surrogate of sodium. But nonetheless, that's what we've got here in our discussion.

I did review the reports and the conclusions of Dan Stephens with regard to groundwater modeling and so on. I think that his approach was fine. I don't have any disagreements from the conclusions that he's reached from his modeling. But I haven't done any modeling myself.

Q. Right, you're just -- you're not a modeler, you're just accepting the results of his model?

A. For this project, that's correct.

Q. Correct. But I guess you were just saying, then, that was something I think that you brought up once before, you thought sodium should be used as a tracer for --

A. Yeah.

Q. -- produced water?

A. Yeah.

Q. Why would you recommend that?

A. I didn't quite recommend it that way. What I said is that as I take a look at the issues associated with these types of pits, it appears to me that the concern primarily is sodium chloride, the concern as far as I can tell is impact on groundwater, and it looks to me like the impact is palatability more than anything else. Okay?

If it's palatability and health concerns with regard to high sodium, then sodium is a more direct measure than chloride, because chloride also was a reflection of calcium chloride, potassium chloride, magnesium chloride, and the other anions and cations that we have in this balance of liquid that we call our migrating ionic constituents.

You know, when we talk about salt bulges we're talking about sodium chloride, but we're also talking about a salt bulge from calcium chloride and so on.

Q. Yes, but then sodium is --

A. Sodium appears to be a more direct measure, but I'm confused as to what OCD's objective is, and I continue to be confused as -- What are they trying to protect? What is the effect that you're trying to mitigate?

Q. Well, do you --

A. And as a result -- and as a result of that, I'm just saying, from the health point of view, if it's a health concern, sodium is a more direct measure.

If all you're trying to do is trace water migration, chloride is great because it goes right with the water front. Okay?

Q. Well, I've --

A. But I'm --

Q. -- I've always --

A. -- not quite sure --

Q. -- understood the purpose of using chloride, in industry as well, is that it's a conservative tracer for looking at contaminant migration from produced water, and it also has -- typically has direct standards in most states for protection of water quality.

A. Yeah, I understand what has historically been done. And I continue to raise questions in the regulatory offices that I've visited and talked to as to whether the old way is still the best way. Okay?

And like the discussion here, I think that many of the state authorities and federal authorities and the international authorities I talk to are moving toward trying to get -- and modify their regulations to reflect the best science. Okay? What do we know now that we didn't know when EPA was created in 1970? Why are we doing it this way? What are we trying to do? What...

This risk-based approach that I'm advocating is a way that everybody understands, this is what we're trying to do, this is what we're trying to achieve, and this is what the metric -- the best metric we have now in order to achieve that.

And I'm not finding that in this discussion.

Q. Well, I think maybe -- correct me if I'm understanding you wrong, but I seem to be understanding

that you're saying that chloride is great for using -- for determining contaminant migration, but it doesn't pose -- out of sodium chloride, it doesn't pose the greater health threat. Sodium poses the greater health threat, so --

A. And palatability threat.

Q. And palatability.

So it seems to me from what you're recommending that the state should have both a standard for sodium and for chloride. The chloride shows you the contaminant migration, sodium is going to show you the level of health threat that you're getting from the salts; is that correct?

A. That could very well be.

Now I think that I'm being misunderstood, okay?, because I'm not advocating that *per se*. What I'm really saying is that from everything that I've seen and everything we've discussed, I'm at a loss to figure out what OCD is trying to accomplish here. Okay?

I know what has traditionally been used for the chloride test, and I know how to interpret chloride as a way to look at the waterfront, the migration front.

But other than that, I don't see what utility it has to the issues you're trying to -- you know, to address here, and what are we trying to prevent? You know, chloride impact on water? I don't think so. I don't think so.

Q. Well, we have a chloride standard for groundwater, so why wouldn't we protect for that standard?

A. It's legitimate to do that. I'm just -- I'm just raising the point that I want to -- that from what I'm seeing, I don't know what -- what your chloride standard accomplishes.

If you saw water that was above the chloride standard, you know, what would -- other than the fact that you've got a regulatory exceedence, what real-world implication does that have? How do you interpret that, other than that it's a regulatory exceedence?

Q. Right, but you're making an argument that's not a point of this hearing, you're making an argument that we need to have different standards in the state.

A. No, I'm making the point that we need to have a very clear understanding of what it is we're trying to accomplish. Okay? Otherwise -- otherwise, we're left with a policy that has a lot of historical baggage, okay? It doesn't reflect current science and understanding, doesn't identify to everybody involved what we're trying to achieve, it doesn't give a very clear discussion of why this particular test is the best measure in order to achieve that, and to monitor success or failure.

We have no idea of what the criteria we use to make modifications of our procedures, exemptions,

amendments, variances, that sort of thing...

And at the end of the day we don't know whether we have succeeded. We don't know whether we have spent the public's money in the most effective way, we don't know whether our timing is right, we have no way to plan what we ought to be looking at when the membranes fail in 75, 100 years, whatever. That kind of thing is what I'm really criticizing.

I'm not trying to give you a -- my best recommendation of what decision you should reach. Okay?

I can give you my best judgment of where the technical limitations are. Sodium is a better measure for health effect. What your criterion should be or whether that's even of concern to you, I think is really OCD and the Commission's decision. All I can do is give you my best judgment of what the current science says, and what I think are the best measures for your to consider in your judgment.

Q. Well, I guess I still don't -- I don't understand why you say you're confused. It seems pretty basic. There's a standard for chloride and groundwater, correct, that has --

A. There is.

Q. -- a state standard that we -- that the Commission must protect?

A. There is.

Q. And we have chloride in drilling wastes, correct?

A. Yes, that's correct.

Q. And chloride is a conservative tracer as well, for determining contaminant migration into groundwater, so why wouldn't we be looking at chloride, then?

A. That is a legitimate thing if the Commission thinks that chloride is the metric.

I'm just saying that as I look at it, I don't find real value in a chloride measurement.

Q. So you would find value in using sodium as a measure of contaminant migration, as a tracer?

A. No, I'm no talking about contaminant migration, because contaminant --

Q. Well, that's where I have some -- I know -- keep getting confused, because we're looking at -- one of our main goals as an agency is to protect water quality --

A. Yes.

Q. -- in terms of the environmental regulations that are adopted by the --

A. Yeah.

Q. -- the Commission.

A. But you already know that chloride is chosen because it goes right with the water front. Okay? The contaminants that we're talking about are delayed in their

passage through the soil for a variety of reasons, and they will impact long after chloride has already hit groundwater.

Q. Especially sodium.

A. Okay, sodium, okay? Benzene, same thing. Toluene, same thing, you know. And so that we -- as we migrate through the soil we get a chromatographic separation of all these contaminants, okay? Chloride gives us an idea of how soon that front, waterfront, has hit the groundwater. Okay? Everything else is now timed and delayed for, you know, its migration down to that groundwater level.

Q. Right.

A. So for that purpose, chloride is great. Okay?

Now, what are the contaminants that you're concerned about? You know, all I'm saying is, sodium is one of them. That's the one I'm concerned about, okay? Sodium is one of them, and it's trailing behind that chloride plume.

Q. I agree with you.

A. Okay. And that's all I'm really --

Q. What confused me when you make a statement that I don't understand what it's being used for because you just explained that you understand now what it's being used for, so you are confusing me in your statements, that's --

A. Yeah, I'm sorry. That historically has been what chloride has been used for, is to trace that waterfront.

Q. And while -- since we're kind of on the standards, at one point you made a statement that the WQCC staff was not sure of why we have the standards, the WQCC standards. What are you referring to?

A. They know why we have the standards. They don't know -- the person that we talked to is one of their younger staff. Okay? She told us that she went by -- went and surveyed all the people that she could think of, to try to figure out where they came from, and that agency memory apparently has retired or gone. Okay?

I take a look at the -- this particular criterion, 3101, and I find that some of the criteria are less stringent than federal guidelines, MCLs for example, some of them are more stringent. Okay? So how is that?

And what concerns me is that OCD has apparently adopted the criteria now set by WQCC, and I'm not even sure that WQCC's standards are up to date, and because some of them are less stringent than federal guidelines, I'm not sure that they are appropriate.

Q. Well, I would agree with you. But you also understand, I think -- First of all, your statement -- There is no staff of the WQCC, do you understand that?

A. I have no idea. All I'm trying to do is, I have

a table that has criteria, and -- because when we started to take a look at the criteria we had questions about their being up to date, we called the WQCC to find out, well, what's the source of this, when was this last updated, and how were they developed? Because it didn't correspond to MCLs, or the current list of MCLs.

Q. But the WQCC has no staff, so I guess I don't understand. Did you contact someone in the Environment Department? You didn't contact -- the WQCC is a commission of the state --

A. Yes.

Q. -- it's made up of the heads of agencies. There is no staff of the WQCC. They have no staff and no budget.

A. Well, I don't know the regulatory procedure or the organization. All I -- I asked my staff to contact and track it down as best they could. Okay? The contacted somebody somewhere at WQCC to try to identify just what the source of these numbers were. Okay?

You know, and I'm not really sure that that's all that relevant. All I'm saying is that the WQCC criteria, you know, may be something that OCD wants to take a look at. They can adopt it or -- but I'm concerned that we've got a state criterion that is less stringent than the federal criterion.

And I'm sorry, I don't remember which one it was,

but --

Q. Well, benzene is one example. The state standard for benzene is 10 micrograms per liter, and the federal MCL is 5. So there's a lot of examples. I mean, the WQCC standards were adopted in 1977 based upon the risk assessments that were done at that time.

Admittedly, they have not been updated, and it's been a point of criticism of mine for a long time as well. They do need to be updated.

A. Yeah.

Q. And the Department, I know, has been looking at that for some time; they just don't have the ability to hire toxicologists to do that review.

A. Right.

Q. But I was just a little concerned when you start making statements that the state doesn't know where their standards came from, so --

A. I'm just reporting what my staff reported to me.

Q. From talking with a junior member of some unknown --

A. Yeah, which is why I brought it up here. I mean, it was a junior member, clearly a junior member. But as best we could determine, the agency's -- what I normally would call a corporate memory has been lost here. So I just want to raise it so that OCD is aware of it as well,

because OCD has just, you know, proposed to adopt those criteria.

Q. And they might have -- your staff might have gotten a different answer if they actually had found appropriate people to talk to, then, within the --

A. That's right.

Q. -- the state, then, so --

A. Yeah, that could very well be.

But again, my concern is that some of the criteria are less stringent than the federal criteria. But in this rulemaking, they're being adopted.

Q. Well, do you know if the Water Quality Control Commission is the state regulatory authority under the -- for setting water quality standards in the state?

A. That's my understanding, that's my understanding. I mean, I know why they were adopted and why -- and -- but like you say, they were adopted in 1977, and they haven't been kept up to date. And all I want to do is make sure that the Commissioners know that that's the case.

Q. But your concerns were using them -- it sounds like you have an issue, and you should be taking it up with the -- with standards, you should be taking it up with the Water Quality Control Commission.

A. If that were my charge, I would do that.

Q. Just give me a second here.

A. Okay.

Q. We've covered -- some of this.

I guess we'll come down just to looking at your alternative risk and consequences.

So what you're actually presenting here isn't -- make sure I understand what you're presenting. This isn't really a risk analysis. I see in the -- I don't -- it's hard to say, I guess it's your first slide under thoughts from a risk perspective.

So what this is is kind of a -- it's a summary of your risk-based decisions and then consequences of the actions. But I see this one third bullet that says you're doing this study that's evaluating the consequences.

This isn't all just risk assessment, this is -- risk assessment is looking at --

A. This actually --

Q. -- typically looking at threats to the public health, correct?

A. Much broader than that, but -- depending on the type of risk assessment. But this section here really is more of a discussion about risk management, okay? And --

Q. Okay.

A. -- you know, we're trying -- I get asked about all the time.

But I thought it was important to make the point

that any decision has consequences. Some of the consequences are beneficial, and some are adverse. And so the point here was that there are a number of things that were giving me concern about the proposed rule, okay? WQCC, that sort of thing.

At the end of the day, I think that the state -- the people of the State of New Mexico deserve to have a rule that is well conceived, well thought through, and one of the things that I hadn't seen in any of the discussion were alternative consequences. Okay? And so I wanted to bring that up here.

The industry sponsored studies, I've cited them in here. You know, like I say, we can quibble about the numbers and the assumptions that we made and so on, but nonetheless the decisions that are going to be reached with regard to this rule are going to have consequences, and they're not going to be zero. And I just wanted to make sure that it was raised as part of the discussion here.

Q. Well, I guess I can follow up, I think, as to what some of the discussion was yesterday. A lot of the likely consequences revolves around truck traffic, correct?

A. That's the data that I saw in the industry analysis, that's correct.

Q. And the industry is greatly concerned about the increase in truck traffic, correct?

A. That's my impression from the comments I've heard.

Q. Well, it's, I think, what you were presenting here as well.

A. Yeah, all I'm doing here is just simply saying, these are some of the adverse consequences that in the industry reports were raised. Okay?

But I mean, other consequences that I haven't raised is, the state has a finite budget. Okay? And certain amounts will go to OCD and their programs, certain amounts will go to funding health policy and so on. Okay?

I want to make sure that we understand that when you're talking about allocation of resources there are consequences in areas where we have not really thought through, and I hadn't heard that kind of thinking in any of the discussions with regard to the pit rule here. So my point is --

Q. Well, I'm just following along with what you've got, because I'd look at this as what you're presenting is your conclusions that you have based -- you have made based upon -- assuming the work of others, because you're not an economist, you're not a petroleum engineer, you're not a hydrologist, et cetera, or reservoir.

You're basing -- but you're presenting to us conclusions based upon the work of other industry experts

here, correct?

A. Yeah, yeah. But again, my point is, I deal with risk management, okay? Not only risk assessment but risk management --

Q. Right, I understand.

A. -- and deal a lot with regulatory programs. Okay? And so all I'm saying is that, you know, let's make sure that first of all what we're trying to achieve, okay?, and understand that any decision we make to achieve that will have consequences in other areas.

And all I'm doing is taking the data from the industry reports and saying here are some examples. Okay? These are not all of them.

Q. Well, you're doing more than giving examples, you're making conclusions based upon -- that's what I see, that's -- Correct?

A. Well, they're not my conclusions, I guess, but they are examples of adverse impacts, and beneficial impact.

Q. Well, I agree, but what you're doing is, you're presenting conclusions of the overall industry experts that you have been working with in this; isn't that correct?

A. Well, I'm citing their conclusions, yeah.

Q. Okay. And just getting back to my original question, the truck traffic was -- is a major issue for

industry; is that correct?

A. That's my understanding, yes.

Q. And so if we start looking at things on a risk-management basis, should we be concerned about limiting drilling activity in the future if we get a large increase in drill rigs with the price of natural gas, irregardless of this rule, should we start looking at problems with dust and truck traffic, fatalities? Should the Commission be considering that in allowing -- making allowances for additional drilling in the -- say the San Juan Basin, for example?

A. Well, I would submit that you actually already are, whether you -- whether you do it in a -- you know, ignoring the issue or whether you do it as a direct consideration of it. You're -- already you're considering it.

That didn't make sense, did it?

Q. No.

A. Let me try that again.

(Laughter)

A. Whether you -- whether you do that in a way that is direct and formal and written and fully visible and transparent to the community, you know, is a decision of procedure, I think, for you. But regardless, these are effects. So whether you're -- whether you're open about it

or not, you're going to have impacts to these areas, at least.

Q. Well, at least to my knowledge, the Commission or the Division has never placed any limitations on new drilling due to truck traffic, according to -- if I follow the logic of what's going on here, the Commission should do that in the future, if we have new drilling in the San Juan Basin?

A. Well, what I'm hearing in the discussion is, you already are. You're talking about a need for perhaps treatment facilities in the northwest, you're talking about perhaps accessing the Environmental Department's waste facilities. So I mean, you're already doing that.

Q. Where are we already doing that for regulating the amount of truck traffic in the oil and gas industry?

A. I don't know, but all I'm saying is, I think that from -- I thought the discussions here, at least what I'm hearing in talking to various people, have included those kinds of concepts.

Q. Well, industry has done that, and maybe you can point out to me where that's been done in the past.

A. I'm probably speaking out of hand, I'm doing a second -- second-hand report.

But nonetheless, you know, I think that those are issues that will need to be addressed. You know, whether

the Commission and the OCD chooses to do so, I guess, is a matter of policy and procedure.

Q. But what I seem to be hearing is the industry is recommending that we regulate essentially the amount of truck traffic in the oilfield industry, because they have a great concern over the amount of truck traffic that's going to occur from this.

But if I take the relationship here, it seems like that would also apply to truck traffic in the industry in general, and that we should be regulating the amount of truck traffic, fatalities, dust emissions, CO_2, carbon monoxide, effects that are occurring as well from truck traffic in the oil and gas industry. That's what I'm hearing from your testimony and from others.

A. Yeah. Well, I'm going to make a couple of comments. You know, I think that these sorts of effects are inherent in the proposed rule. Okay?

The second thing I'd like to clarify is that my job is not to advocate for the industry. I was retained to give my best advice to the industry group and to testify here to give you my best appreciation of the situation, the issues and the science.

I've tried to repeat, you know, in my testimony, that I'm not here to make the decisions for you, nor to -- but actually just simply to raise issues, and -- as I see

it, and to make sure that I give you my best advice and observations so that you can make your decisions.

So I know you're asking me, doesn't the industry want this? And I can say, well, yes, I've heard that that's probably the industry viewpoint. But it's not my job to argue on behalf of the industry that these are the things that you need to consider. All I'm doing is giving you my best advice as to what I think the issues are and some of the things that I'm seeing and not seeing in the process of our --

Q. But it seems to me what you're -- well, you are representing industry, you're here representing --

A. Right.

Q. -- the industry committee.

A. I am being retained by the industry committee. But the charge that I was given was not to take their position and to try to justify it. My job was to give them my best evaluation of the data and advice on how to collect those data and then reflect that here.

Q. But everything that you have in here -- the only actual work that you conducted was the risk assessment for protection of public health, correct?

A. That's right, that's right. I bring that evaluation, as well as my experience in the risk-assessment, risk-evaluation and risk-management areas, as

well as my experience in regulatory development.

Q. And then when you come down to risk management, you're just providing a summary of the industry position, then?

A. I think the industry has been appropriate to identify these as consequences. Okay?

But again, my point was not to give validity to their numbers or anything like that. My point was simply to raise here that there are consequences that ought to be considered as part of this process.

Q. Well, I think we all agree there's consequences as part of any action. But when I look at this, you're telling me that you're not advancing a position that is directly in your document.

A. No, I am advancing the conclusions in my document. There are adverse consequences, some of which include these.

Q. Which are those identified --

A. Yeah, absolutely.

Q. -- by industry?

A. Absolutely.

Q. Okay.

A. But I will -- I will also tell you where I see good things in terms of the things, and I'll tell you when I see bad things. Okay? I'm concerned about sodium,

sodium chloride. Okay? That's the one issue that I see that is clearly an issue here.

Q. Right, I think we talked about that.

A. Right.

(Laughter)

Q. Well, I guess and then advancing the positions, that I come down to the alternate risk consequences, and you're estimating that the new rule will provide $50 million more per year in compliance cost. And where does that number come from?

A. That's from Daniel B. Stephens' report.

Q. And that's based upon -- were you here for the testimony from the Daniel B. Stephens witness on that?

A. I heard the latter parts of Mr. Pease's testimony.

Q. And his numbers are based upon trucking all the waste from northwestern New Mexico down to southeastern New Mexico?

A. That's what I heard.

Q. And he did not account for waste disposal facilities in the San Juan Basin?

A. That's what I heard.

Q. So then that's a flawed -- flawed number that's been provided?

A. Well, I -- like I say, I can't comment on all of

that because I don't have the sources of his data either. But I think that the industry was correct at pointing these issues out. Whether the numbers are accurate or not, I can't comment.

Q. Well, it's more than just the numbers are correct, it's whether the statements that are made are correct, that there is no disposal facilities in the south-- in the northwestern part of the state. More than just the numbers.

A. Again, I can't comment.

Q. And then I'm down on your conclusions here, where you're talking about OCD -- based on their proposed language, OCD's primary concern is odor and taste impacts on groundwater. What are you basing that upon?

It's in the first -- within the first bullet of your conclusions.

A. Yeah, the point I wanted to make is that without a very clear statement of what it is that is concern, you know, just reading what the rule is trying to achieve and what -- the constituents that are driving the actions that are being taken, that, you know, the analytical data say that it's not health-driven. Okay?

Therefore, what is it?

And as I look at it, it's palatability from sodium chloride, and it's possibility of TPH staining soil

or perhaps soluble parts of TPH getting to groundwater and affecting -- adversely affecting the taste of water, taste and odor of water.

Q. Well, I guess I come back to, again, this discussion we had before. We have specific standards in water quality that we are required to maintain.

A. Correct, correct. And if that is the objective, that's fine. Let's just make sure that it's up front, that that's the objective. Okay?

As I take a look at the constituents of concern here, I'm left with the conclusion that what we're all doing right here is talking about the program to prevent impacts on the staining of the soil and the odor and taste of the water.

Are we sure it's really worth the cost?

Q. And what do you base that conclusion upon?

A. I don't see anything else that's driving that concern. Okay? Other than the fact that we have existing regulations, and we certainly want to enforce those.

Q. So isn't that the driving force of what we're doing --

A. Well --

Q. -- is protecting --

A. -- you can --

Q. -- existing water quality standards --

A. I don't think so.

Q. -- in the state?

A. I think that what you're really trying to do is protect the public health, you're trying to protect the environment and so on, and whether your regulations achieve that, I think, is always a question that needs to be re-evaluated. Okay?

Here we're talking about an entire regulatory program. It's going to require enforcement, it's going to require compliance. Let's make sure we know exactly what we're trying to achieve. No matter what the regulations were 10 years ago or in 1987 or '77, you know, let's make sure that they are up to date, they reflect the current understanding, and they are achieving what we wanted to achieve back in '77, that they are doing the job for us now and will continue to do so in the future.

Q. Yes, but again, you're coming back to the argument that you don't think the standards are appropriate, and that's fine, but that's not a basis for making statements that the OCD's primary concern is odor and taste impacts on groundwater.

A. Well, all I can tell you is that, having looked at all the data -- and I've spent a lot of time looking at the data that we've got available as to what's in these pits -- I come to the conclusion that the only thing we're

achieving here is, we're protecting odor and taste of water and staining the soil.

And that's a terrible statement.

And I've looked at a lot of sites around the world.

Q. And so we're not protecting existing water quality for the standards that have been adopted by the State of New Mexico?

A. What are you protecting it from? I'm looking at the data for these particular pits. Okay? What is it in these pits that are really giving you concern?

Q. And I think we --

A. That's -- We kind of go around. I mean, it's kind of the regulatory viewpoint, as opposed to my consulting viewpoint, I think.

You know, it's -- that's -- but ultimately as the consultant where I've talked to both industry and I talked to the regulatory people and I talked to all different kinds of groups, you know, I continue to have to make the evaluation as to, well, what is it that we're trying to achieve here, and how do we best do that? Okay?

And there are times when I will develop an entirely new approach that nobody's ever seen before, and I'll advance it to the agency and say, This appears to be the best situation, the best way to deal with this

particular, you know, site or contaminant.

Q. Well, have you ever --

A. And I -- And all I'm saying is that we ought to be doing the same thing here. As best I can tell from all the data that I've looked at, we're protecting odor and taste and staining.

Q. Have you ever talked to OCD about what they're trying to accomplish with these regulations?

A. Yes.

Q. And that's all you can come away with, is that they're protecting odor and taste of groundwater?

A. No, that's my conclusion.

Q. Okay.

A. That's my conclusion.

Q. And I come down to the second bullet in your conclusion, it talks about the transference of risk.

A. I'm sorry, where are you?

Q. On the same page, does the OCD proposed pit rule reduce actual risk? And it talks about transferring the risk.

A. Yes.

Q. And so is it your testimony -- I guess, are you just summarizing this aspect of risk related to -- just to the soil exposure, because you're -- everything else you're doing is based upon the conclusions of all the other

witnesses, right? You're just summarizing --

A. Yeah.

Q. -- their testimony?

A. When I take a look here -- Like I said, the one constituent that I've got concern about is sodium chloride, is the salt. Okay?

And when I take a look at that, you know, everything in my experience says that what we're really concerned about there is the mass of sodium chloride that, if potentially released, could impact on something like groundwater. Okay? Odor and taste. Not odor, but taste, you know, palatability. Okay?

And so essentially as I read the rule and evaluate what it -- what the implications are, the closure in place with small volumes and small amounts of sodium chloride is going to be replaced by making large pits that contain sodium chloride but greater -- much greater mass of sodium chloride.

If a release occurs, that mass will impact -- will have a much more serious impact on groundwater than the small pit.

Q. Well, at the same time the larger facility is built with much greater environmental protections than is given to an in-place burial where the thing's just covered up; isn't that correct?

A. It could very well be, could very well be. I'm looking at at some point there will be a membrane failure. Okay? At some point there will be a release. Okay?

And the question is, if that's the case, then are we going to need to -- What actions are we going to take?

Q. Well, do you understand, these facilities are double-lined, leak detection, they have all kinds of monitoring and other requirements associated with them?

A. And all I'm saying is that the lining will fail.

Q. And so you --

A. It may be a hundred years from now, but that lining will fail. Now the question is, what are you going to do with that huge mass of sodium chloride moving toward the groundwater?

Q. And you think a facility with more environmental controls has a higher risk than a facility with no controls?

A. No, not risk. I'm saying the risk is 100 percent, in both cases. It's a matter of the impact.

Q. So engineering controls --

A. And the size of the impact --

Q. -- have no bearing -- engineering controls have no bearing upon risk?

A. They do, but if the membranes are intact for the small pits you've got the same effect. I mean, you've just

got the same control, except that you do not have the underground, you know, fluid collection or things like that.

In theory, if you've got an intact membrane, you're not getting the salt out.

Q. Are you telling me that the -- an in-place burial has the same engineering controls as a --

A. No, I'm not. I'm saying from the practical viewpoint of salt -- containing salt within the pit, if you've got a membrane and it's intact, then you've got no migration of salt out of that pit, right? Okay? And that's the same for a commercial -- OCD-approved commercial facility and the same for the small pits on site. Okay? It's not until the membrane fails that we start to see a release.

Q. Yes, but if a membrane fails and you have engineering -- other engineering controls in place, then you have less risk than you do from a single liner that's sitting out there; isn't that correct?

A. What other engineering controls have you got that are now retaining that salt?

Q. Well, you have a double-lined facility and leak detection --

A. If the membrane fails, what -- you know, and you're getting a release, what other control have you got

there that --

Q. If you have a leak in the primary liner, what happens?

A. You've got a secondary liner. But now you -- both of them are 75 or 100 years old, and they now start to fail. Okay?

I don't -- I don't doubt that you've got all these nice engineering controls so that for the first 75 years or so they'll be fine. But at some point we're going to have a physical failure of the liner, I'm saying, and a release.

And all I'm saying here is that what we've managed to do is transfer the risk from the smaller cells into a very large cell. And I've not gone through all the engineering thinking about what we're going to do at that point, but at some point we're going to have a release from both types of -- both situations.

Q. Well, we'll just have to disagree on that.

You seem to be saying then, too, that you can have one facility which has more of a limited potential for impacts, even though it has a larger mass of contaminants, correct?

A. Are you talking about the commercial facility?

Q. Yes, commercial facility --

A. Yes.

Q. -- has a larger mass of contaminants, and you have one of those, so you --

A. Right.

Q. -- have -- versus a thousand --

A. Correct.

Q. -- other locations.

A. (Nods)

Q. And you believe that large numbers of landfills is a lower risk than a single landfill?

A. I think that that needs to be considered.

Q. I agree that it needs to be considered.

Coming to your next page in your conclusions --

A. Uh-huh.

Q. -- I think I went into this a lot, but I just -- in the third bullet down it talks about greenhouse gas emissions. And that's a big concern, I guess, because industry is real concerned about global warming?

A. All I can tell you is that this one of the things that was listed in the D.B. Stephens report --

Q. So is it --

A. -- and it --

Q. -- then, that industry --

A. -- will be --

Q. -- has a large concern about global warming?

A. I can only tell you that this was one of the

things that was in the report. If that reflects an industry concern about global warming, then I guess they're concerned about global warming.

Q. And I come down a couple slides later, you talk about the -- in your conclusions, the -- it doesn't have a number on it. It says -- at the top it says, Proposed industry approach provides similar benefits at less cost.

A. Right.

Q. And direct exposure risks, you have down there on one of the bullets is, Direct exposure risks (residential and construction) are *de minimis* for onsite pit closure.

How is -- how is that conclusion derived?

A. Well, as I told you, going through all the data my conclusion is that there's really not a health-driven cause here. Okay? Because I look at the direct exposure potential of somebody eventually in the future building a house over these areas.

I don't see either in the construction or the resident who lives there for 30 years -- I don't see a -- a health risk from the data that we've looked at.

Q. So are you basing that on the idea that nobody will build a house over it?

A. No, I said even if they did, the risks are *de minimis*.

Q. Because we have had instances of pits -- houses

being constructed right on top of pits, such as the Shell Westgate subdivision; isn't that correct?

A. I'm not familiar with it.

Q. Okay.

A. These are drilling pits?

Q. That was not a drilling pit, it was just a pit that was -- that nobody had a knowledge of, and it was --

A. Yeah, I'm sure that occurs all the time. I've dealt with that kind of situation too. They weren't drilling pits.

I'm saying from the data that we have on drilling and recycle pits, you know, I'm not seeing a health -- that would have been caused from possible future building of a house over the pit, in direct contact with the contents.

Q. But you're basing this solely for the results that you did for the San Juan Basin then --

A. No.

Q. -- not the salts for --

A. In Lea County.

Q. In Lea County as well?

A. (Nods)

Q. So you think if somebody comes in and -- some major excavation, make a basement in a house and digs up a whole pit and spreads it all across their yard, that doesn't pose a risk to their property?

A. From the data that we've seen, the answer is no.

Q. And there won't be any problems with them just having their kids out playing in the yard with salt wastes, with highly contaminated salt wastes?

A. Not -- again, I'm concerned about salt --

Q. Uh-huh.

A. -- okay? because it's irritating --

Q. Uh-huh.

A. -- to the skin. Okay? But the -- I mean, all of New Mexico has got a pretty high salt content, salt load. Okay? From the data that I'm seeing, I'm not seeing an adverse health effect, even if the kids are playing in the dirt.

Q. So if I follow your logic, we can use this material for constructing playgrounds and stuff then?

A. It's possible.

Q. Okay.

A. What we're talking about is natural muds in the subsurface constituents that they're -- pulled up from drilling.

Q. And then down to your last slide, your conclusions, you say that OCD is not making a risk judgment but OCD is making a value judgment.

Isn't the data you presented here making a value judgment?

A. I'm raising risk issues. What I don't see is the evaluation or the -- I don't understand the thought process going into OCD's proposed rule. Okay? It looks to me like they are in fact making a value judgment, that they've decided up front that they don't want small pits, that they want them excavated and moved to commercial facilities. Okay? But that was a judgment made up front, and I'm not seeing the data to support that judgment.

So as I summarize here, I don't think they're making a risk judgment, I think they're making a value judgment.

Q. Well, didn't you use judgment in -- value judgment in making your conclusions here?

A. In what way?

Q. You're judging the value of truck traffic and all these other effects, you're using your own value judgments in making your conclusions, aren't you?

A. I don't think so. All I'm doing is pointing out that there will be effects, impacts.

Q. Well, didn't industry make a value judgment? They've assumed that these pits are no problem, and we've heard that for years without any data being collected, so they had a value judgment that they had made that the pits aren't causing the problem, and they've hired their experts to determine that their value is correct, their values are

correct, and their judgment?

A. No, that's not true. That's not true. That's not how I would characterize it. What I told you is that my contract or retention by the industry group was one to give my best professional judgment. If my judgment was adverse to their position, so be it. Okay?

Q. So you don't believe --

A. My job is not really to justify their position or their value judgments or anything like that.

Q. And so OCD's witnesses aren't using their best professional judgment?

A. I'm sure that they are. I'm just saying that from my perspective they're not justifying appropriately the judgements that they're making.

COMMISSIONER OLSON: Can we take a break?

CHAIRMAN FESMIRE: Now would be a good time.

COMMISSIONER OLSON: Uh-huh.

CHAIRMAN FESMIRE: Why don't we go ahead and take a 10-minute break and reconvene at 25 till?

(Thereupon, a recess was taken at 10:25 a.m.)

(The following proceedings had at 10:38 a.m.)

CHAIRMAN FESMIRE: Let's go back on the record.

This is a continuation of Cause Number 14,015, all three Commissioners are present, there is a quorum therefore present.

We were in the Commissioner's examination of Dr. Thomas.

Commissioner Olson, did you have further questions?

COMMISSIONER OLSON: Yeah, I had one or two.

Q. (By Commissioner Olson) I think at one point you were mentioning that you didn't understand why we use TPH as a measure of contamination. Maybe you can explain why you were thinking that. Or maybe I -- make sure I have you -- assessed correctly what you said, first.

A. I think I said it's not clear to me what the concern is that the OCD has with regard to TPH. It seemed to me that they had used a fairly simplistic analytical method that was inexpensive and fairly easy to conduct, and I can see value in that.

Again, I was raising concerns about the -- alternative methods gave a little bit better detail, so that better judgments could be made with regard to health risk.

But from everything I'm seeing, it looks to me like the levels of TPH really are not that significant. They exceed the waste oil criterion that NMED has in -- I think it was a single pit there. But as I look at it, it's not really -- from a tier 1 criterion basis, it's not really a major health concern either.

So as I thought through it, the only thing I can see that's gained by TPH, if it's not health, it's got to be staining the soil, a cosmetic problem.

Q. Well, would you maybe at least agree that TPH is useful as a measure of just gross contamination as an easy screening method for gross contamination?

A. Could be, it can be. Yeah, probably in -- in New Mexico it probably is a measure of gross contamination. In other areas where it's a lot more vegetation, then suddenly you find a suggestion of contamination, there's no petroleum present.

Q. Right, depending upon the method that you use.

A. Right.

Q. Right. Was your main concern, then, just the method that they were using for TPH, using gas -- you know, I guess you were proposing using gasoline-range, diesel-range organics --

A. Right.

Q. -- versus the 418.1 method?

A. Right, they differ in their toxicological properties and their environmental risk properties. So I think that's probably a better measure, if it's a TPH concern.

Q. I guess even though -- that method is a higher cost, though, to run than the 418.1 method.

A. Yeah, it is more expensive.

Q. Right.

A. And it takes longer.

Q. Uh-huh.

And -- oh, and at one point you were -- I think this was your earlier testimony -- maybe it was later, I'm not sure anymore -- you were criticizing, I guess, OCD for not having a sampling plan. But I didn't see any sampling plan that you had provided here.

A. I didn't provide one, but there was a 24-page sampling plan that the industry had developed in early 2007, and it was a -- it was a formal sampling plan for a field mobilization. It talked about what the objectives of the sampling program were, it talked about what samples would be collected, where they would be collected, what equipment would be used, what analytical tests would be run on this, it would talk about the health -- provide an HS&E-type plan, health, safety and environment-type plan. It talked about protective equipment, it talked about safety meetings for the staff, what they should know before they go on site and so on. So it was a fairly detailed work plan.

Q. But you didn't provide one here yourself either, then, as part of this proceeding?

A. No, not -- the sampling and analytical program

were really done by the industry group. It's not my position, really, to give the field work plan as part of my testimony.

Q. So I guess are you saying because you don't know what the OCD sampling plan was that their data is invalid?

A. No, I didn't say that. I just said that a lot of the detail as to what they collected, how they collected it, whether they put it in amber vials or in clear glass or in plastic, that's not specified. Okay? How they -- Did they add preservatives in the field? What control -- quality control samples did they take? Those kinds of detail are useful to me as I'm evaluating the quality of the data and the validity of the data. And, you know, I didn't have a lot of information with regard to what samples were collected and how they were collected and so on.

Q. Well, are you aware that the OCD has a QA/QC plan that is approved by EPA?

A. No.

COMMISSIONER OLSON: I think that's all I have.

EXAMINATION

BY CHAIRMAN FESMIRE:

Q. Doctor, I want to start right there. The detail of the sampling plan wasn't provided to you, right?

A. Yes, it was, for the industry --

Q. No, the -- You've said the OCD sampling plan, the detail wasn't --

A. That's correct.

Q. -- provided to you?

Did industry provide the detail of their sampling to the OCD?

A. I have no idea.

Q. Okay. Doctor, when I was a criminal attorney we had something that we called the some-dude syndrome. You'd take a -- for instance, a proposed plea bargain in to a defendant to talk to him about it and he'd always say, Well, somebody else got a better deal.

You'd ask him who?

He'd say, Some dude.

Well, who's his attorney?

I don't know, some dude.

And I seem to see a some-dude syndrome creeping through a lot of your testimony here. I just asked you the data that you were criticizing and specified one of the major criticisms, and you can't tell me why that's relevant here. Who did it, who -- I mean, why -- why is that a question here? You can't tell me that the industry provided their sampling plan to the OCD, and yet you based a lot of your -- all of your analysis on the samples gathered according to that sampling plan, and yet you sit

there and criticize OCD's sampling plan.

A. No, I didn't criticize it, I just said we didn't have one.

Q. You didn't have --

A. We didn't have --

Q. -- one?

A. -- access, or it wasn't provided --

Q. And is that not a criticism, that you didn't have one?

A. No, I think my statement was that the OCD data essentially are in agreement with the industry group data.

Q. No, we're talking about the sampling plan, Doctor, we're talking about the plan that you were criticizing.

A. Okay.

Q. You criticize OCD's plan, but you had that plan to criticize, right?

A. No, I don't have the plan from the OCD.

Q. You did not -- the OCD didn't provide you with their sampling plan?

A. No, they didn't provide any --

Q. They didn't provide you with a copy of the task force sampling --

A. -- nor did the industry provide me with their sampling -- with the OCD sampling plan.

Q. Okay. Now when did you first get involved in the pit rule, or -- for the industry committee? When did they first engage you, and when did you first start working on it?

A. You know, I would assume that's 2006 sometime.

Q. Can you tell me any better than 2006 sometime?

A. October, something like that?

Q. Do you not know?

A. Not off the top of my head, I don't recall.

Q. Okay, but your best estimate is October?

A. It would be probably October.

Q. Of 2006. When was the decision made to do the sampling, in the industry plan -- in the industry sampling plan -- project?

A. It was my understanding that there had been two OCD-sponsored public outreach meetings in December of 2006 and January of 2007. At those outreach meetings, there were questions raised about what's in the pits, and the industry went back and decided to do their sampling program at that point.

By February of 2007, they had their whole sampling plan program. They had hired a consultant to develop that and also, once they had approved that, go out into the field. So in February of 2007 they now went out and collected those samples, sent them to the laboratory

for analysis.

Q. And when was the OCD notified of that sampling project?

A. I have no idea. I wasn't part of those discussions.

Q. You said that the Oil and Gas Act requires risks to be considered in the regulatory process. Could you elaborate on that some?

A. Yes, the Oil and Gas Act, as I recall, requires that the -- that public health and the environment be protected. Okay? And so essentially -- I've kind of probably over-extended the thing about risk, but protection generally refers to something that's posing a risk. Okay? And so what I'm saying is that it requires that a risk be addressed.

Q. But when you made that statement you say that perhaps you overextended a bit when you made the statement?

A. Yeah, because it doesn't mention the word "risk", I think, in the Oil and Gas Act. It talks about protection.

Q. Okay. Now you talk about temporary pits, and then you kept mentioning drilling and recycle pits. What is a recycle pit?

A. My understanding is, that's the oil and mud being recycled back down the hole and then back up to the pit.

Q. Okay, so that's a drilling and recycle pit?
A. That's my understanding, yes.
Q. I'm going to jump around on the subjects here because -- well, it's parts of several pieces of testimony, and I apologize if they're not --
A. Certainly.
Q. -- not coinci- -- I mean collinear there, but...
The industry sampling plan, you said that you don't know if the OCD was notified?
A. No, I don't.
Q. Okay. You said at one point in your testimony that you had been told that the Governor's task force had received a copy of the industry committee analysis; is that correct?
A. That's correct.
Q. Who told you that?
A. Not only that, but I was asked to summarize the results of the evaluation that I was doing as part of that communication.
Q. Okay. Now who told you to do that?
A. Dennis Newman.
Q. Can you remember exactly what he told you?
A. We need to summarize what we found, essentially what he said.
Q. He said, We need to summarize what we found?

A. Or what I found, actually, was his terms.

Q. Okay. And can you give us a pretty detailed description of your involvement in the sampling plan? Did you develop the sampling plan? Did you -- You said you didn't go to the field to do any of the sampling?

A. No. The sampling plan was developed by S.M. Stoller, which is an environmental firm that does field work.

Q. Did you have any input in it?

A. I was -- as I recall, I was asked to review it, I think, but my recollection is a little hazy on that. But it was a fairly standard sampling plan and had components, parts that I was talking about.

Q. And how was that plan implemented?

A. Once it was approved, they went out to the field and collected samples.

Q. Who's "they"?

A. Stoller.

Q. Stoller. So Stoller did the sampling?

A. That's correct.

Q. Did they split the samples?

A. I don't believe so.

Q. Did they notify OCD that they were doing the sampling?

A. I don't believe so. Like I say, I don't know the

details about what they did in terms of field implementation.

Q. And you say that occurred in February and March of 2007?

A. The field sampling? It should have been by the -- toward the middle, I think, of February.

Q. Okay. And then you were provided the analysis?

A. The results of the analysis, right.

Q. And do you remember when you got that analysis?

A. About April of 2007.

Q. Now at one point in your testimony you said that it was your understanding that all drilling materials would have to be hauled and disposed of at landfills; is that correct?

A. As I read the rule, the 3103 criteria right underneath the pits are likely to be exceeded and therefore would need -- it would trigger the excavation and hauling away.

Q. Okay, and you -- you don't understand that the proposed rule provides an option outside of a 100-mile radius for burying on site, right?

A. I -- You know, that kind of detail is not really part of my evaluation.

Q. And you testified that the OCD and industry analysis were essentially similar, right?

A. The results.

Q. Okay. Were there any pits sampled that didn't show up in your results?

A. Any pits sampled?

Q. Sampled, that did not show up in your results?

A. No.

Q. How do you know that?

A. We took a look at every sample that was collected and evaluated, and the -- you know, many samples were analyzed multiple dilutions and things like that. All of them were there.

Q. Okay, and Stoller certified to you that there were no other samples taken, just the ones that were presented in that analysis?

A. Well, we actually got the laboratory reports in addition to a Stoller compilation of the data.

Q. Okay. You're not answering my question, or I'm not asking it right here. Were there any samples taken that did not show up in your analysis, in the analysis that was given to you?

A. The samples that were supposed to be collected were represented in the data, data analysis, that I saw.

Q. Okay. Now, Commissioner Olson hit this a little bit. If Mr. Pease's conclusions were incorrect, so would you analysis be of the -- in your conclusions part

concerning the truck traffic and things like that?

A. I've done no analysis of truck traffic.

Q. Okay, in your conclusions when you --

A. In the section on alternative impacts?

Q. Alternative risk consequences? You talk about drilling material hauled, VOC emissions, dust emissions and CO_2 emissions.

A. Yes.

Q. Okay, those aren't your conclusions, those are -- ?

A. My conclusion is that they will be -- they will have impacts in those areas.

Q. Okay, and that's based on Mr. Pease's report and his conclusions, right?

A. That -- Well, and my experience as well. You know, those are -- there will be impacts in those areas. So whether Mr. Pease's assumptions and numbers are the same --

Q. Okay, if Mr. Pease's conclusions were overstated, if the numbers were overstated because the information that he had was not correct, your conclusions would also be overstated, would they not?

A. I made no conclusions. I just simply reported his numbers.

Q. Okay, your -- your list of --

A. My input or testimony is that there will be an impact, and those are areas that will be impacted --

Q. Okay --

A. -- actually seen.

Q. -- so the things listed under alternative risk consequences are straight out of Mr. Pease's report?

A. And also my experience.

Q. Which ones are your experience?

A. That there will be emissions of VOCs from truck traffic, the -- being on roads will create dust levels, and I forgot the third one that you were talking about.

Q. There's a CO_2 emissions --

A. CO_2 emissions will be part of the emission from an automobile as well.

Q. And those aren't the same numbers that Mr. Pease came up with in his report?

A. No, I'm talking about that I'm -- my point is that there will be impacts in those areas --

Q. Okay, but there are numbers listed here --

A. The numbers there are Mr. Pease's numbers, and they can be overstated.

Q. Okay.

A. They're not part of my conclusion.

Q. Now, in the analyses, in the appendix to 9, you talked about some of the averages were arithmetic averages

and some were geometric averages. Which is which, and why?

A. Okay, in statistics, arithmetic average is used to summarize the central tendency of a bell-shaped curve, data that are in a bell-shaped curve.

A lot of time in environmental data what you see is that you have a peak at one area and then a very long tail with high concentrations, is usually the pattern. That type of distribution is called a log-normal distribution. And to do the appropriate statistical tests or a descriptor of that type of distribution you use what's called a geometric mean or average, geometric average.

So the --

Q. Which constituents represent arithmetic averages and which represent log-normal averages?

A. If you take a look at the range, you can see those situations where the average that's reported there is in the middle of the range. In other cases you'll see that the average is offset to one side or the other in the range. Okay? That's an indication that you've got a geometric -- or a log-normal distribution, and require a geometric average.

Q. And the decision to use one or the other is purely judgment on your part, right?

A. No, I actually did some statistical tests to determine whether or not you could call this a normal

distribution.

Q. Okay. And there are other distributions besides logarithmic and normal distributions that you could have used --

A. Uh-huh.

Q. -- right? But you limited it to just those two?

A. Yes. Yeah, the distributions that we're looking at seem to fall into those two categories.

Q. Commissioner Olson again touched on this. I just wanted to clarify something. Your assumption is that the OCD or the WQCC TPH standard is -- that it's just based on odor and taste problems?

A. Would you repeat that?

Q. The TPH standard that is promulgated by the WQCC, it's your belief -- or your assumption that this is based on an odor and taste problem?

A. I think the TPH standard that you're talking about, Environmental Department, I think, as opposed to WQCC?

Q. Okay. But your assumption is that that standard is based on a taste and odor problem --

A. No --

Q. -- not on a health problem?

A. -- no, it looks to me -- Again, I'm not quite sure what the source of the criterion that OCD is citing

is. They don't tell me. But it looks to me that it most likely comes from the Environmental Department.

And the 2500 criterion that they set is one that is a risk-based -- it's a health-risk-based standard. It makes assumptions with regard to what size class of hydrocarbons are present in a waste oil.

And on that basis they -- for each size class, they've assumed that you've got a surrogate toxicant that is going to be the one that represents that size class. And depending on what proportion or percentage of that size class hydrocarbon or that size class -- in that size class, you come up with a number, and that's 2500. Okay? It's based on health effect -- or health concerns, not odor and taste.

Q. Okay. Now you've heard the old adage, dilution is the solution to pollution, right?

A. I've heard that.

Q. And the idea is that the dispersion of pollutant into the environment is much better than concentrating it, right?

A. Yeah, that's what that concept said.

Q. Okay. And isn't that what we're doing by leaving the individual pit contents at specific sites?

A. I don't think that's any more than what you're doing in putting it in an OCD landfill.

Q. But that's the point I'm trying to make. If we're dispersing those contaminants out into the environment in individual pit sites, as opposed to concentrating them into controlled waste management facilities, we're following the old adage, Dilution -- or dispersion -- is the solution to pollution, aren't we?

A. I've never heard that adage applied in that sort of way. The way I've always heard it, it was that you had a contaminated site, and if you just mix enough clean soil into it, suddenly it now met all the regulatory criteria.

Q. But aren't we doing the same thing on a macro scale then? We're just dispersing the pollutants out into the environment, rather than concentrating it.

A. You could characterize it that way.

Q. And isn't that adage pretty much discouraged in the environmental industry today?

A. No, I don't think so. I think that -- once again, that it's situation-specific, you know. It depends upon what your concern is, and the best strategy to mitigate that concern.

Q. Now you made the statement that, I'm suspicious that a liner will fail at any time. And you reiterated that a couple of times under cross-examination. Why did you say that?

A. I said at some time, at some time in the future.

Q. Okay, I wrote down at any time. You may have been right.

Okay, why do you feel that way?

A. That's what I understand from the use of the geotechnical lining materials, that they have a finite life span.

Q. Okay. And you understand that. Is that based on research or study, or just a general known?

A. It's a general known, but I've also done some reading in the area. As you know, I've also dealt with RCRA sites and Superfund sites and so on.

Q. Now several times I heard you say, I'm not concerned about that constituent, I'm not concerned about that concentration. The only thing you don't like is chloride. I've written that down in my notes.

Is that the only thing that we need to be worried about in these pit wastes?

A. No.

Q. What else, from the analyses that you've done?

A. As I mentioned, I'm not that concerned about chloride either. It has a functional -- being in terms of monitoring the waterfront, but --

Q. Then why are we worried about wastes at all in the drilling pit business?

A. That's a good question. In fact, that may have

been one of my points as well. You know, I'm having difficulty seeing why OCD is concerned about these constituents --

Q. Okay, and --

A. -- except sodium chloride, and with that I'm concerned with the sodium, not the chloride.

Q. Okay, and so the groundwater contamination that we've had as a result of pits -- granted, maybe some of them -- most of them are disposal pits, but the groundwater contamination that we've had as a result of pits shouldn't be of our concern?

A. No, I think that that's a mischaracterization. You know, every situation or every pit may -- if it has different constituents, will raise different risk issues. Okay? And if these are disposal pits, they have different materials in them, and many of those materials may be of issue. And so my comments do not refer to those types of pits at all.

Q. During the industry committee meetings -- not the industry committee, the task force meetings, did any of the members consult you or ask you to speak before the task force?

A. No. And I have not attended any of the industry group meetings or -- That's not true. I mean, we've had meetings where I reported my results and things like that.

Are those the type meetings you're talking about?

Q. No, I'm talking about the task force meetings, the Governor's task force on the pit rule.

A. I've not attended any of those meetings.

Q. Were you ever asked to make a presentation at those meetings?

A. No, only to write an accurate summary of what we've done and what we've found.

Q. And was that presented at the meetings?

A. It was given to the task force, yes.

Q. Okay, but the question was -- It was given to the task force?

A. To the Governor's task force.

Q. And who specifically on the task force was it given to?

A. It would have been Dennis Newman.

Q. Now, I'm getting back to the some-dude problem again. First you said, I talked to the staff -- a lower-level staff member of the WQCC, then you said, We talked to a staff member at the WQCC, then you said someone on your staff talked to a lower-level staff member at the WQCC. I need two names here. Do you know who they talked to that's on the staff of the WQCC?

A. I'd have to get that for you.

Q. Okay. And who on your staff talked to them?

A. It would be Dr. Chunn.

Q. How do you spell that?

A. C-h-u-n-n. She got married recently, so it would be Chunn-Lindsey now.

Q. And you said it was clearly a junior member. What made you make that statement?

A. What Dr. Chunn told me, it was at a -- it was a young person --

Q. Okay.

A. -- I don't think that she would have been around in '77, you know, so I believe that she's probably a junior member. She talked -- the report that I got was that she had surveyed some of the older people in the department, and they didn't have a good, clear understanding of how these were developed.

Q. Now you said you were retained to give your best advice to the industry. Was it the industry or the Commission or both, or how was that exactly worded? What was your charge?

A. The -- It was the industry group. You know, I'm not quite sure all the different industry groups and how they're organized and stuff like that.

Q. Neither am I.

A. Dennis Newman is the one who led the communications with me, you know, and he talks about

getting executive committee approval and that sort of thing. So all I can tell you is that my primary contact and source of information was Dennis, in that regard.

Q. Now, you mentioned that you talked to somebody at OCD. Who is that?

A. About OCD?

Q. No, at OCD. You said you'd had some conversations with people at OCD.

A. The industry group actually participated, as did Dr. Neeper, in discussions with regard to various issues and things like that, so we had a number of OCD staff there.

Q. Can you remember any names?

A. Wayne was there, Mr. van Gonten was there, I believe you were there --

MR. BROOKS: (Nods)

A. -- there were probably other staff members there, but I just don't recall names.

MR. BROOKS: Just for clarity in the record, let the record reflect that when Mr. -- when Dr. Thomas said, You were there, he was looking at me --

THE WITNESS: Thank you.

MR. BROOKS: -- and not at the Chairman, who was the party questioning, since anybody reading the record would tend to interpret it the other way.

(Laughter)

CHAIRMAN FESMIRE: Thank you, Mr. Brooks, I do appreciate that.

Q. (By Chairman Fesmire) Do you remember when those meetings were?

A. No, I'm sorry, I don't.

Q. Were they after the sampling program, prior to the --

A. No.

Q. -- sampling program?

A. No, it was before.

Q. Before the sampling program? And when I say the sampling program, I'm talking about the task force sampling program that OCD did with the split samples and everything.

A. I've not dealt with the OCD staff with regard to the sampling program or anything.

Q. Now what's the difference in the contents between drilling pits and other pits?

A. The difference in content?

Q. Yes, the analysis on drilling pits and other pits?

A. Well, the -- depends on the nature of the pit. Disposal pits, of course, can get a lot of things and anything that's used on site.

Q. Okay, do you have any specific analyses of the

disposal pits?

A. No, no --

Q. So how do you know that there's a difference, Doctor?

A. And completion fluids and things like that, you know, certainly have different constituents as well. So, you know, just from the work that I've done in the industry, I can tell you that the constituents are going to be different.

Q. Okay. And you know disposal pits have been used to dispose of drilling fluids and completion fluids and things like that, don't you?

A. It wouldn't surprise me.

Q. Okay. So I guess getting back to my question, what is the difference in the content?

A. From what to what?

Q. In the -- the difference in the content between a drilling pit and a disposal pit?

A. In terms of content?

Q. Yes.

A. I would think that the --

Q. What I'm looking for, Doctor, is the basis of your answer, There's a difference in the content.

A. Well, again, there are a number of materials that are used by the industry that go into a disposal pit. It

could be everything from chlorinated solvents, you know, that are used for degreasing, it could -- motor oil that may be used. You know, all kinds of things that could go into those.

Q. And you realize that those can go into drilling -- have in the past gone into drilling and workover pits, haven't you -- don't you?

A. I -- like I say, it wouldn't surprise me that -- historically a lot of things have gone into pits because they were there.

Q. Okay. And when you say pits, do you mean drilling pits?

A. Drilling pits included.

Q. Now you made the statement -- I think you were talking about liners. You said when the membranes fail in 75 to 100 years. You were talking about liners?

A. Yes?

Q. Do you have anything to base that number on? Where did that number come from, that 75 to 100 years?

A. I've seen estimates as little as, say, 40 years. Okay? But it depends on the nature of the liner and so on. But you know, those numbers occur in a variety of, you know, brochures, they occur in -- even in some of the published literature.

Q. Now, you said a couple of times, especially under

cross-examination by Commissioner Olson, you're confused about what OCD is trying to protect, trying to prevent.

What should OCD be trying to protect or prevent?

A. Well, the reason why I'm not confused is because I'm not seeing things other than sodium chloride.

Q. And you made that point with Mr. -- with Commissioner Olson. But what should we be trying to protect?

A. Well, my understanding, the Commission is chartered to protect public health and the natural resources of the State of New Mexico, and groundwater I assume.

Q. And what we're doing is not protective of public health and the environment?

A. I'm sure it is.

Q. Now again, I'm -- being the last to ask the questions, somebody gets all the good questions. Mr. Olson asked you -- and I want to paraphrase his question, put a little bit of my twist on it.

When the rig count went from 60 to 90, was industry concerned about the potential consequences with respect to safety and emissions and road wear?

A. When the rig count -- I don't remember all the details of that question, but -- Could you repeat that?

Q. When the rig count in New Mexico went from 60 to

90, which are, you know, just gross averages over the most recent couple of years, was industry concerned about the road safety, road wear and emissions?

A. I don't have any way to judge that.

Q. Okay.

A. I don't think that I was part of that discussion.

Q. Okay. But you can see if the rig count increases by 50 percent, there's going to be a significant increase in the things that were part of your presentation -- I hesitate to say conclusions, because you've adamantly said that they were somebody else's conclusions. But they increased them, too, didn't they?

A. They should, yes.

Q. And I guess what I'm asking is, are you telling this Commission that they should take a look at those factors and perhaps limit the amount of drilling activity in New Mexico due to those factors?

A. No, I haven't said that at all.

Q. Okay. Why not? It would seem like a logical conclusion drawn from some of the arguments that industry has made here and that you've repeated.

A. You know, increasing rig count or decreasing rig count is a tactic that you may want to consider, but you know, that's strictly your decision.

Q. Okay.

A. The issues, you know, are --

Q. I kind of liked the answer where it was, Doctor. Do you want --

A. Well, the --

Q. -- to expand it?

A. -- but the issues -- the issues that we're talking about are there. It's a matter of determining from the -- or from your perspective, whether they are significant enough to require some sort of thought process.

That was poorly worded, but -- Do you want me to try to repeat that?

Q. If you'd be more comfortable.

A. I'm fine, but essentially it's -- I consider that to be an issue that is a possible thing that needs to be considered in framing a regulatory policy. Okay? The decision, of course, rests with the Commission.

Q. And while it may have been implicitly part of a decision, prior decisions by this Commission, it's never been specifically addressed, especially with respect to the issues that were raised in the most recent industry argument on that.

Should we in the future consider that?

A. It's difficult for me to judge. And the reason why is because if you consider it, it will have consequences as well. And I don't really know enough about

the government and all the issues here to really give you advice on that.

CHAIRMAN FESMIRE: I don't think I have any further questions.

Mr. Hiser, do you have a redirect?

COMMISSIONER OLSON: Well -- well --

CHAIRMAN FESMIRE: Commissioner Olson?

COMMISSIONER OLSON: -- I've got one more thing I just wanted to bring up.

FURTHER EXAMINATION

BY COMMISSIONER OLSON:

Q. Coming to your attachment A --

A. Okay.

Q. -- in Exhibit 9, you list the range and the averages of the constituents that you found in drilling muds with comparison to the NMED's screening levels. And I think we established before what you had represented here is the screening levels for ingestion of soils and residential exposure, correct?

A. Correct.

Q. Why did you not also compare it to the NMED screening levels for migration pathways to groundwater? You used part of the New Mexico Environment Department screening levels but not all of them.

A. Right. As you pointed out, the New Mexico

Environment Department uses totals. Okay? I don't think that's appropriate, to use total, and so as a result I did not use that criterion. I used the TCLP, the leachate concentrations, to give me an idea how much soluble material was there.

Q. And do you understand how the NMED soil screening levels in their version 4 are used?

A. Yes.

Q. But you're selectively just using the portions that you like?

A. No.

Q. You're only using one portion of --

A. I was actually part of the team that helped develop NMED's risk-based approach, okay?, at a previous company.

What I'm saying is that the NMED, like most regulatory agencies, don't have this history of using total metals, for example. Okay? You'll notice that I've appropriately compared that to the criterion here, but the thing that is evolving is appreciation of the soluble or the leachate-type test. Okay? And when I now take a look at that, comparing that to a soil level protection of groundwater, I can't do that except multiply by 20 and see if I can get back to a soil level. Okay? It's a very crude estimate, and maybe not right for the -- just an

initial screen.

Q. But if I was to use the NMED soil screening levels the way they are applied in the State of New Mexico, I would take the contaminant concentration in the soils, whether you're using averages or whatever you have here, and I would compare that to all of the NMED soil screening levels; isn't that correct?

A. For a full risk assessment, that's correct.

Q. Right. And if I compare your screening levels to the NMED screening levels, and even taking the most beneficial to industry of using a DAF of 20, which would be the one that would be -- I would assume industry would prefer to use, I see that the migration pathways for arsenic, barium, iron, benzene, toluene, xylenes and naphthalenes are above NMED's DAF soil screening level.

A. Yes. Arsenic is a good example. If you take a look at arsenic and you see that -- if you apply that criterion, then in theory we should have a fair amount of arsenic in the water, and in particular we should see it in the leachate which is an acidified water. Okay?

Arsenic was shown to be nondetect in every sample that was collected.

Q. In every sample that was collected from the drilling pits?

A. Yes. When you take a look at the solubility in a

leachate, you know, the TCLP leachate, arsenic was totally nondetect in every sample that was collected --

Q. And I --

A. -- which is --

Q. -- I come back again to the --

A. -- which is why I'm saying that comparing it to a soil -- total soil concentration and making the assumption that, well, some of this is soluble with a DAF 20, even, you know, we've got an exceedence, really starts to raise a question about that particular total measurement and how the agency is starting to -- or is interpreting it.

It's a -- it's a quick screen, but in terms of its relevance to the issues that are really posed by these types of pits here, I don't think that -- I think arsenic is a good example of just where it goes wrong.

Q. Right, but I guess I come back to the way -- my earlier question. How are these soil screening levels used? You take the solid -- the concentration in the soil, correct?

A. Correct.

Q. -- the total concentration in the soil, and you compare it to the NMED soil screening levels, correct?

A. That's correct.

Q. And if I look at the arsenic, barium, iron, benzene, toluene, xylene and naphthalene concentrations

that you observed in the drilling pits, they are in excess of the NMED's DAF 20 soil screening criteria for migration to groundwater, correct?

A. Correct, correct. Now this program was not designed to be -- you know, to demonstrate regulatory compliance. This program was designed to give the industry and the Commission here my best judgment as to what the issues are. Okay?

And so the fact that we can measure total and find that it exceeds the groundwater protection criterion for soil is an interesting thing, but I didn't think that was relevant. I was more interested in looking at the leachate concentration, what we actually see as soluble and environmentally mobile and bioavailable.

Q. Right, but essentially, then, you're coming down and just selectively using NMED's soil screening levels the way that you believe is appropriate. You don't want to consider -- you want to use part of it, but you don't want to use other parts because you disagree with them?

A. Exactly right.

Q. And -- but that's not the way that they're applied in New Mexico, is it?

A. If this were a regulatory compliance evaluation, you're exactly right.

Q. And so what would be the -- what is the effect of

it being in excess of the NMED's DAF 20 soil screening levels?

A. For arsenic? It's not effect.

Q. But what does it mean if it's in excess of DAF 20 levels? So -- do you understand the --

A. From the regulatory point --

Q. -- how the documents are used?

A. From the regulatory point of view, you'd be -- you'd have a regulatory exceedence.

Q. Right. And what does that mean based -- what would happen based upon that?

A. You would need to take action, perhaps go into the tier 2 or tier 3 parts of the risk assessment process.

Q. Right, it means that there's a potential threat from migration to groundwater. It doesn't mean it's going to get into it, it means there's a potential threat for migration to groundwater, correct?

A. From the regulatory perspective, yes.

Q. And so you have the option of cleaning that up or performing a tier 2 analysis, correct?

A. Right.

Q. And has industry performed a tier 2 analysis on these?

A. No, not at this stage. Again, we're not -- we're not trying to demonstrate regulatory compliance, what we're

trying to do is determine what constituents are there, what form are they -- they are there, and now what does it mean with regard to developing a regulatory program? Okay? We're not trying to -- you know, essentially demonstrate compliance with NMED's criteria or their theoretical approach.

Q. Well, at one point you say you're in compliance with NMED's criteria, but you're selectively using the portions that you like, that you say you're in compliance with.

A. Yeah, you could say that.

Q. So it's not in compliance with the DAF 20 criteria, and therefore would -- under NMED's screening levels would either require cleanup or performance of a tier 2 analysis; isn't that correct?

A. That's correct.

COMMISSIONER OLSON: Okay. That's all I have.

CHAIRMAN FESMIRE: Mr. Hiser?

MR. HISER: Just a very few questions.

REDIRECT EXAMINATION

BY MR. HISER:

Q. Dr. Thomas, on the whole issue of truck traffic, isn't it the point that was raised in Dr. Pease's report -- or in Mr. Pease's report from Daniel B. Stephens Associates and from your analysis that you were looking at more the

incremental impact of the increase in truck traffic on a per-unit-of-production basis as a result of the proposed rule?

A. Yes.

Q. And so regardless of where the line of total rig count moves up or down, there will be more truck traffic and hence more emissions and more potential accidents or fatalities as a result of the adoption of this rule than there would be without the adoption of this rule; is that correct?

A. Yes, that's my opinion.

Q. Now you and Commissioner Olson have been involved in a long discussion about the 3103 constituents and the NMED soils screening levels -- and you may not be able to answer this question; if you can't, simply say so. Are the NMED SSLs actually regulatorily binding standards that must be met under all circumstances for the guidance factors that are used in assessing cleanup?

A. Well, they're not standards that have legally -- legally binding. They're generally considered guidelines, but they're enforced as the -- as --

Q. -- as an appropriate cleanup standard --

A. Yeah.

Q. -- basically?

A. Yeah.

Q. Now, is your concern with the 3103 constituents driven in large part by your belief that the constituent levels that have been observed in the pits, based on both the OCD sampling and the industry committee sampling and your general knowledge, do not present a threat to either the existing Water Quality Control Commission standards or to public health or environment, with the exception of sodium chloride?

A. Would you repeat that question?

Q. Is your con - -- Now, in the discussion that Commissioner Olson has been raising things about, Well, how are you addressing the regulatory standards, and don't you need to be concerned about this?, and you've said you're not concerned about that, is that because you don't believe that the materials in the pits would actually reach the groundwater at a level that would exceed the standards?

A. Yes, that's correct.

Q. And so if the material in the pit wouldn't reach the groundwater at a level in excess of standards, would that address Commissioner Olson's concern about whether this rule, whether it be the OCD rule or the industry committee proposal, would protect the Water Quality Control Commission standards that he's expressed a concern about?

A. Should.

Q. Now Commissioner Fesmire -- Let me go on to one

other thing. Now I believe that Commission Olson brought it out that the NMED's SSL program allows subsequent tiers, 2s, 3s, whatever, consideration of additional factors as to what should be done with a given site that may show contamination above a tier 1 level; is that correct?

A. That's correct.

Q. And in that tier 2 or tier 3 analysis, would you be looking at things such as the actual solubility of the material in reaching a decision about whether groundwater migration is a legitimate basis for concern at that site?

A. Yes.

Q. And the last question was one that Commissioner Fesmire had raised, and that was about understanding about materials that were disposed in what he characterized as a disposal pit and in a drilling pit. And he asked you a question about whether the same things might go in closed pits, and your answer was that historically that might be true.

Based on your experience with the industry, do you believe that all those materials still go into drilling pits here in the 2005-2007 era?

A. It's a little hard to judge. You know, in general, I think the industry is doing a fairly good job. I'm suspicious that there are bad actors in any group, so I can't really give you a full answer.

Q. But in general there's regulatory prohibitions and other --

A. In my experience, I think the industry does a fine job of segregating their waste and minimizing volumes, because to a large extent they're financially liable at some point in the future.

MR. HISER: That concludes my questions.

CHAIRMAN FESMIRE: Is there any recross on the subject of the redirect?

MR. BROOKS: No, Mr. Chairman, none from us.

MR. JANTZ: None, Mr. Chairman.

MS. FOSTER: No, Mr. Chairman, thank you.

CHAIRMAN FESMIRE: Mr. Huffaker?

MR. HUFFAKER: No, sir.

CHAIRMAN FESMIRE: Commissioner Bailey, do you have any?

COMMISSIONER BAILEY: (Shakes head)

CHAIRMAN FESMIRE: Commissioner Olson?

FURTHER EXAMINATION

BY COMMISSIONER OLSON:

Q. Just getting to this issue, you believe it won't reach -- the contaminants won't reach groundwater. It's based solely on TCLP leachate, but you're not an expert in contaminant migration, are you?

A. I've done a fair amount in contaminant migration.

Q. But you are --

A. But also it's not just based upon the TCLP leachate. For 3103 constituents, for example, we looked at the -- you know, where 3103 contaminant was identified in the total, we would take a look at that because we may not have had a TCLP for that.

We said, Well, gee, if we use the SPLP procedure it automatically involves a dilution 20-fold, because that's the volume of the extraction solvent. Okay? And if we divided this total in the solids by 20, would we exceed the criterion? And the answer was no.

Q. Right, because you're allowing for 20-fold dilution.

But you're still not -- if you look at the NMED screening levels for the DAF 20, which you are not accepting, it is above the screening levels for potential migration to groundwater, and you'd have to find the extent of contamination; isn't that correct? And --

A. Yeah, if we were doing for regulatory compliance, that's true.

Q. And was the extent of contamination underneath these then defined to confirm whether or not there's leachate going to groundwater?

A. No, not with regard to the soil level for protection of groundwater criterion, no.

COMMISSIONER OLSON: That's all I have.

CHAIRMAN FESMIRE: Dr. Thomas, thank you very much. Oh --

MR. HISER: Before we let him go, Mr. Chairman, we'd like to move the entry of Dr. Thomas's Exhibit 9, which is industry committee Number 9.

And since there's been so much discussion of the industry committee's sampling data which we previously provided, we also have that, and these are the sampling analysis report, of which a summary was provided in the summary that Dr. Thomas -- but this is the complete document, if the Commission so pleases.

CHAIRMAN FESMIRE: At the end of testimony? At the end of testimony?

MR. HISER: Well, we had not originally intended to really do this, but just to rely upon Dr. Thomas's summary, if it was requested we'd provide that data in the interest of being full and open, so we have no objection to that full set of data being in the record.

CHAIRMAN FESMIRE: Okay.

MR. HISER: And then as you said, we -- how the -- that data was developed, and so we also have copies of the sampling analysis plan to go with that data and to anybody else who would like it.

CHAIRMAN FESMIRE: Okay. Is there any objection

to the admission of Exhibit Number 9?

MR. BROOKS: No objection to admission of Exhibit Number 9.

CHAIRMAN FESMIRE: Why don't we go ahead and admit Exhibit Number 9.

Why don't you make the other two documents available to counsel --

MR. HISER: Okay.

CHAIRMAN FESMIRE: -- and we'll take up the question of their admissibility after lunch, okay?

MR. HISER: That would be fine.

CHAIRMAN FESMIRE: At this time is there anyone in the audience who would like to make a statement on the record?

Okay, is there anyone else?

Okay, why don't you come forward --

Oh, Ms. Foster, you had -- ?

MS. FOSTER: Mr. Chairman, I do have a question about the public hearing or the statement provisions since we're doing this right now, it just kind of popped into my head.

I had a question by a Legislator who wanted to know which was the best way to come in to make a statement, if it was possible, due to his legislative schedule, would it be possible for me to read something into the record for

him, or would he actually need to come in here?

CHAIRMAN FESMIRE: If he's going to make the statement on the record, he would need to show up. We are accepting written statements until the close of evidence, so...

MS. FOSTER: Okay, but the written statements -- but the written statements do not have the weight in the record as -- like the sworn statements would, correct? I just want to make sure I relay the correct information back to him.

CHAIRMAN FESMIRE: I would think that they're all -- I mean, they are all equally weighted, at least in my determinations, and they are all read, so if it would be easier for the Legislator to provide a written statement on the record it will become part of the record, and it will be considered in the decision.

MS. FOSTER: Okay. And then the other question I had was from a client who wanted to know if it would be appropriate to send his attorney in his stead to make a statement on behalf of the company, just --

CHAIRMAN FESMIRE: Well, the attorney would be capable of making a statement on his own, so I see no problem with him making a statement on --

MS. FOSTER: Okay, thank you.

CHAIRMAN FESMIRE: -- behalf of the company.

MS. FOSTER: Thank you.

CHAIRMAN FESMIRE: Why don't you come forward? You've been here a couple of days, you know the drill?

MR. ROBINSON: I'll be sworn in.

CHAIRMAN FESMIRE: Okay, why don't you raise your right hand?

(Thereupon, the witness was sworn.)

CHAIRMAN FESMIRE: Start with your name, please, sir.

SEAN ROBINSON,

the witness herein, after having been first duly sworn upon his oath, testified as follows:

DIRECT TESTIMONY

BY MR. ROBINSON:

MR. ROBINSON: All right. Have to forgive me if I shake a little bit. I'm a little nervous.

My name is Sean Robinson, I'm a drilling engineering supervisor with ConocoPhillips, located in Farmington, New Mexico.

I have a bachelor of science in mechanical engineering with a minor in math, and an MBA. I'm an engineer in training, so I'm in the process of licensure, and I've been drilling approx- --

CHAIRMAN FESMIRE: Did they tell you to say that?

THE WITNESS: Sorry? No, I've been --

(Laughter)

THE WITNESS: I've been here, so I know the question.

I've been drilling for approximately 11 years, mostly domestically. I have three years of international experience in eastern Canada. I've worked in Texas, Wyoming, California, the Gulf of Mexico, Louisiana, Colorado and New Mexico, as well as I mentioned eastern Canada, so a significant amount of experience in the drilling industry.

I was here for Mr. Poore's testimony, where there were some questions regarding costs and cost savings not being taken into account regarding some of the case studies and other evidence that's been presented. Hopefully I address some of those issues in my statement.

As a drilling engineer for the last 11 years, fundamentally my job is to reduce costs. I have no impact on reserves, I don't do a reserve -- I can't tell you how much gas is in the ground or how much oil is in the ground. That's not my job.

So if you have a numerator and a denominator, I can only impact one of those, and the only number I can impact is cost.

So I guess my job for the last 11 years was, I always get asked, Why can't you lower your cost? Why can't

you lower your cost to make X or Y project viable?

So I take great pride in making sure that my estimates are correct and accurate and that I lower the cost as much as I possibly can.

I'm very proactive in trying to identify new technologies and applying those appropriately. There are many new technologies that are always being developed, and trying to put those in a correct places.

So as I heard about this testimony initially I tried to avoid coming, and obviously -- anyway, I'm here, so...

As I've looked at some of the case histories that have been presented on savings that the industry -- industry papers showing savings from closed-loop systems, I was very interested as a drilling engineer to see if I could utilize some of those case studies to my benefit up in northwest New Mexico for ConocoPhillips, so I've reviewed -- I'm sure it's not all-inclusive, but I've reviewed all the case studies that I could find that -- Some of them were input into evidence, there may be others that I didn't find.

But anyway, I'd like to go through those, just so that you understand how -- if some of those items are applicable or not, for ConocoPhillips in northwestern New Mexico.

I believe most of these would be in Exhibits 7 and 8 of the OGAP. I don't know if that's correct. You may or may not have those documents with you. I'd like to go through them really quick.

There are a total of eight case studies that I looked at in the two exhibits, 7 and 8. Of those exhibits, five were unique, so three were repeats, if that makes sense. They were identical case studies, cited twice. So I have five unique case studies I'll go through really quick.

The first one was in Exhibit 7, and this one I tried to get the data because I was extremely interested in this one. It showed on a percentagewise some significant improvements. They documented, they said 23 percent fewer rotating hours, 39 percent improved ROP, 37 percent fewer bits, 33 percent [*sic*] fewer days, and 43 percent lower fluid costs.

So as a drilling engineer, that's a huge impact. If I can cut -- a typical well, you've heard, there's 12 days. If I can cut three or four days off of that well, that's an incredible savings.

So I wasn't able to find all of the -- or any of the data. I actually went to M-I Swaco and talked directly with them, and I searched the Internet because it had an Internet reference for this -- the paper. I couldn't get

the data.

But I was a drilling engineer, I've made huge improvements similar to that, and it hasn't been from purely one item. It's typically from multiple items. For example, a change in bit technology or using a new mud motor or some other product.

CHAIRMAN FESMIRE: The synergy of the multiple technologies?

THE WITNESS: Correct. So I can't take issue with particularly -- or maybe all of those being a benefit. The drilling engineer that did that, that guy needs to get a raise.

But the -- but attributing it all to closed-loop, in my opinion, may be problematic. I believe there may have been other items. The fewer -- the lower fluid cost, 43 percent, that could potentially -- maybe that's all or a big part of it. Some if it will be the fewer days, because you'll use less fluid if you reduce days. So a big compounding effect.

Exhibit -- That was case number 1.

A second case in the Exhibit 7, it talked about challenges associated with conventional reserve pits, and basically there were again two wells that were compared.

The first well had a reserve -- had three different pits for use in the drilling environment.

There's a 235-by-77-foot, a 20-by-10 and a 40-by-10. So three pits. Total surface area was .4 acres for those pits.

In northwest New Mexico our current pit size, just the pit, for our deep wells is .21 acres. So my pit is significantly smaller already than that pit size.

And with the open pit they generated over 16,000 barrels of waste. With the closed-loop system they only generated 1100 barrels, they said. So a significant improvement.

Just in reference to the volumes that -- a pit with two foot of freeboard, which is the maximum we would ever fill a pit to, would contain approximately 7000 barrels in the northwest, on our deep wells, so the biggest pits that we use. The coal wells would be about 4500, 4600 barrels.

The volume, if you take the whole volume and times it by six, so the solids content, you'd have approximately 2600 barrels of solids in that 7000-barrel pit. So I'm going to have a -- anyway, I don't know -- I may be able to realize some benefit, but the drastic benefit from 16,000 barrels to 11,000 [*sic*] barrels of solids, I'm going to have a difficult time, because my current waste level is so low already.

They also documented some benefit in reduction of

sites. I think Mr. Poore testified to that, so I don't necessarily need to go into that.

Our sites currently are under two acres, the usable site. Disturbed area may be larger, because we have a buffer zone around, and the re-seeded area would also be larger because again a buffer zone, though it's not usable during the drilling process and completion process, it is disturbed, so -- or maybe potentially disturbed and needs to be re-seeded.

Again, kudos to the engineering team. A huge savings in waste and a huge savings potentially in cost. But for northwest, not particularly applicable.

Exhibit 7, case number 3, these are two -- these are two wells drilled in Oklahoma, and they're comparing the two wells. One was drilled with a closed loop and one was drilled with a reserve pit. And there was a small savings, it says $12,700 savings was achieved.

I would contend that -- initially I was going to dig into it, but then I realized that the two wells that they compare are -- it was like an apple and an orange. One was drilled with larger hole size. This is the same formation, so they went to the same target, but the engineer probably -- if it was me, I would look at the previous wells that have been drilled. What can I change? They were able to downsize their whole size. So reducing

-- clearly reducing the volume of generated. And they also air-drilled one section, which would also reduce volume generated.

And in northwestern New Mexico we've already -- we drill 6-1/4-inch production hole, which is the smallest production hole I've drilled in my career, so we've basically -- there's 10,000 wells, effectively, that ConocoPhillips operates up there, and we kind of know we've optimized.

And we also air drill, so we minimize waste with that.

So both of those are already being used, so we can't -- I didn't see a benefit.

Again, great job by the engineer. That's what my job is, is to find opportunities to improve and reduce costs, but again, maybe not applicable in northwestern New Mexico at today's date.

Then the next one was Exhibit 8, case number 1. And I couldn't compare these very well. It looks like it talks about two different drilling examples, and the overall savings was in the neighborhood of $1300 per well. They say they used closed-loop in 50 wells, and they used a reserve pit in one well. So again, I don't have dates, so I don't know if the one well was really old and the ones that were drilled with closed-loop were relatively new.

But I do know, based on the document, that conventional rotary drilling with the reserve pit, which was the first, that's an antiquated method of drilling now. We don't use purely rotary drilling very many times anymore. Many times we use a mud motor and a PDC bit, which is what they did with the 50 wells that documented the savings. They used a closed-loop drilling with mud motors and diamond bits of 50 wells.

So again, good job for the drilling engineer. They utilized mud-motor technology, PDMs, and they used the PDC bit rather than a -- probably a roller-comb bit, which is a -- increases rate of penetration and saves time and days.

So again, those methods -- we currently drill with a pit, but with mud motors and diamond bit. So potentially the benefit may not be there for those in that case.

I think I have just one more.

Exhibit 8, case number 4. This one was -- I guess I didn't find very much data, but fundamentally what the operator was able to do was to incentivize the drilling contractor and shift the risk. They wrote a turnkey contract, and included in that turnkey contract, the requirement that they handle and dispose of the waste.

So the liability was taken from -- Well, I'm sure

the liability didn't move, but the cost and responsibility moved from the drilling contractor to the operator. I do see a benefit in that, because if someone is monetarily incentivized to reduce waste, I've seen that work, so I do see positive there.

But the -- on the contrary, I would be, as an operator, a little bit nervous if I incentivized potentially a drilling contractor to take care of my waste. Because they are motivated by cost savings, they may not dispose of it in a proper manner, compared to what ConocoPhillips, with our beliefs, how they would dispose of it.

Now that doesn't say that they did it incorrectly. It doesn't actually -- the case study doesn't talk about how the waste was disposed. They may have been able to dispose with landfarming or some other method, rather than a dig-and-haul.

So basically take away, again, eight case studies, five of them had neat things. And there are some things that I can take away, for instance, that somehow incent the drilling contractor to minimize waste. That's always positive.

The second was -- is, we're going to struggle at ConocoPhillips to keep that incremental cost, that $115,000, as -- I gave that to John -- Mr. Poore, quite a

while ago, and since then I've got a lot of new estimates, and I am really -- I'm going to try and hold that $115,000 because of the impact you've seen, based on Mr. Poore's testimony, is potential reserve write-down. So if I can't maintain that $115,000 or lower, that reserve write-down was -- is significant. So I'm going to try and keep the $115,000 but the cost estimates that keep coming in are increasing rather than decreasing, so I'm -- I've told management $115,000 and I'm going to try and hold that line.

And then to me the huge incentive is to reduce data. So I'm going to find other technologies -- if I use closed-loop, I'm going to try and use other technologies to improve my rate of penetration so that I can cut the 12 days to 10 or some other method. So I'm not going to sit on my laurels, but there may be other ways that I can attack that $115,000.

And then the last thing is just -- I think that was it. Anyway, that's all I'll say. Thank you for your time.

CHAIRMAN FESMIRE: Okay, are there any questions of this witness?

MR. HISER: (Shakes head)

MR. BROOKS: No questions, your honor.

CHAIRMAN FESMIRE: Commissioner Olson?

COMMISSIONER OLSON: Just one.

EXAMINATION

BY COMMISSIONER OLSON:

Q. So it sounds like you're trying to keep that $115,000 to a maximum, $115,000, and hopefully try to get better on the cost; is that what you're trying for?

A. That's -- My job is to reduce the $115,000. Can I -- right now -- like I said, John has presented it to management, and they know the $115,000, so that's kind of the benchmark for me. And clearly, I wanted to reduce that cost, and I will be working. But recent cost estimates, for example, the air drilling, I missed the cost by $2000 a day, which is -- that's already been a 12-day lull, that's $24,000.

So I'm going to -- I've got to find another -- I have to save a full day plus to counteract that 25 that I guarantee I will lose.

And then we preset the surface casing, and that -- if we require -- and it's air-drilled, it saves about $12,000 per well, and if I have to go -- these are -- it's like a lot of well drilling rig, it doesn't have a subfloor, it's very low-tech but very cheap. And if I lose that benefit because I have to go closed-loop, I have to throw that cost back in.

Anyway, it's going to be a struggle, yes.

COMMISSIONER OLSON: Okay, thanks.

CHAIRMAN FESMIRE: Commissioner Bailey?

COMMISSIONER BAILEY: No, no questions.

EXAMINATION

BY CHAIRMAN FESMIRE:

Q. You said you worked in eastern Canada. They've got some pretty strict environmental regulations up there, don't they?

A. They do, it was offshore. They adopted, basically, the North Sea regulations there.

Q. So you're a closed-loop expert, so to speak, aren't you?

A. I've experienced closed-loop quite a few times.

Q. One of the things that concerned me is the discussion that it would be difficult to cavitate a well in a closed-loop system. Do you know how they would do that? Or cavitate a well without a pit, I guess, is a better way to put it?

A. It will be -- it will be difficult to do it closed-loop. Based on talking with one of our -- the operations superintendent in charge of the cavitation, he estimates an incremental $300,000 for just the completion part, the drilling of the last 500 feet and cavitating process, and that's a huge hit to a low-cost coal well. Our average cavitation cost is probably $700,000 or

$800,000 for a well. And you throw $300,00 onto it, it's difficult.

So closed-loop cavitation will probably be cost-prohibitive, let alone the fact that it's now closed-loop and the risk is increased.

Typically we'll pressure up to 1400 p.s.i. and bleed instantaneously to atmosphere, but he's -- they have done -- they were close to a river, I believe, so we could not put a pit in, and they attempted a cavitation, just a surge, so a recompletion, and they did it -- they pressured up to only 800 p.s.i., because they were very nervous, and he said he would never do it again, so...

In the long term, will we figure something out? I hope. But it'll be a short-term impact for sure.

Q. Is anybody giving you turnkey contracts now?

A. No, that's -- I didn't make that point, but I haven't had a turnkey contract for at least eight years.

Q. Now you said one of the keys to this was to incentivize risk reduction. That's essentially what this rule would do as proposed, isn't it?

A. Say that again?

Q. One of the keys to this is to incentivize waste reduction, and that essentially is one of the things that this rule, as proposed, would do, isn't it?

A. Because we would have fines if we didn't or --

Q. Because --

(Laughter)

Q. Among other things. There's going to be a significant monetary advantage to the operator who figures out how to minimize his risks, isn't there? Minimize his waste, I'm sorry.

A. Because the haul-off would be less?

Q. Right.

A. Yeah.

CHAIRMAN FESMIRE: I have no further questions. Are there any other questions of this witness?

MR. BROOKS: Nothing.

CHAIRMAN FESMIRE: Thank you very much, sir.

With that, why don't we break for lunch and reconvene at 1:15?

(Thereupon, noon recess was taken at 11:52 a.m.)

(The following proceedings had at 1:20 p.m.)

CHAIRMAN FESMIRE: Let's go back on the record in Cause Number 14,015. Let the record reflect that it is 1:15 on Friday, December 8th, 2007, that all -- Friday, December 7th, 2007, that all three members of the Commission are present, we therefore have a quorum present.

I believe, Mr. Carr -- No, I believe, Mr. Brooks, you were ready to present your next witness, weren't you?

MR. BROOKS: Yes, Mr. Chairman. Do I correctly

understand that the responding parties closed except for further testimony to be presented from Dr. Stephens on Monday?

CHAIRMAN FESMIRE: I think they have finished with their witnesses. I don't know that they have formally closed.

MR. BROOKS: Well, that they've rested, is what I should say.

CHAIRMAN FESMIRE: Okay.

MR. HISER: The only person that the industry committee plans to call at this point would be the rebuttal testimony of Dr. Stephens on Monday.

MR. BROOKS: Very good, that was my understanding.

And has IPANM rested?

MS. FOSTER: Mr. Chairman, yes, IPANM has rested.

MR. BROOKS: Okay.

DR. NEEPER: We have a five-minute --

MR. BROOKS: You have a rebuttal?

DR. NEEPER: Yes, five minutes.

MR. BROOKS: Mr. Chairman, honorable Commissioners, we had announced that we would have one rebuttal witness, Ed Hansen, and that's who we're going to call now.

However, we have made a decision today that we

will also request to recall Mr. von Gonten for brief rebuttal after Mr. Hansen's testimony is concluded.

I think, unless there's extensive cross, we should be able to get both of these witnesses done this afternoon.

(Laughter)

MR. BROOKS: Of course, someone suggested during the lunch hour that we should recall Brad Jones.

(Laughter)

MR. BROOKS: We decided against that.

CHAIRMAN FESMIRE: Okay, Mr. Brooks. Call your witness.

MR. BROOKS: At this time we'll call Ed Hansen.

MR. HISER: Mr. Chairman, at what point were you planning to address the remaining exhibit that was in front of you?

CHAIRMAN FESMIRE: Good point.

Have you -- Mr. Brooks, have you had a chance to review that?

MR. BROOKS: We have reviewed that, and we have no objection.

CHAIRMAN FESMIRE: Okay, is there any objection from the attorneys?

MR. JANTZ: OGAP objects to this due to unfair surprise and lack of foundation, as well as inability to

cross-examine on the exhibit.

CHAIRMAN FESMIRE: Okay, let's take the lack of foundation. What kind of foundation would be necessary to -- other than the witness?

MR. JANTZ: Well, because this was prepared by S.M. Stoller Corporation, and the industry committee has presented no one from that organization to verify the authenticity of this.

CHAIRMAN FESMIRE: But I think Dr. Thomas testified that his conclusions were based on the report of S.M. Stoller, and I'm assuming --

MR. HISER: He reviewed the sampling plan, as he testified.

CHAIRMAN FESMIRE: Right, so I think there is a proper foundation for it. I will note your objection, but I'm -- if there are no other objections, we'll go ahead and admit it.

Okay?

MR. JANTZ: Yes.

CHAIRMAN FESMIRE: Thank you.

Okay. So the -- What are we calling this exhibit?

MR. HISER: I guess it would be industry committee Exhibit 11; is that correct?

MR. CARR: That would be correct.

CHAIRMAN FESMIRE: Okay, industry committee Exhibit 11 is hereby admitted. However, it is labeled Box 12.

MR. HISER: That's because I actually have to return this box to Mr. von Gonten, who graciously lent it to us. He assured me these boxes were in high demand.

CHAIRMAN FESMIRE: It is Christmas time.

Okay, industry Exhibit 11 is hereby admitted to the record.

Mr. Brooks, now are you ready to proceed?

MR. BROOKS: Mr. Chairman, may I approach to give copies of the rebuttal exhibits to the Commission?

CHAIRMAN FESMIRE: You may, sir.

EDWARD J. HANSEN,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BROOKS:

Q. Good afternoon, Mr. Hansen.

A. Afternoon.

Q. And Mr. Hansen, you're still under oath, I believe.

A. I understand.

Q. You understand that. My court reporter used to say he was just waiting for some witness to say, Darn, I

thought I could lie.

(Laughter)

CHAIRMAN FESMIRE: Let the record reflect that that comment is in no way attributed to the witness.

(Laughter)

Q. (By Mr. Brooks) Mr. Hansen, after the conclusion of Dr. Stephens's testimony on Friday a very long time ago, did the industry committee provide you with some additional information relevant to Dr. Stephens's testimony?

A. It did.

Q. And what did that consist of?

A. It had Dr. Stephenson's -- Dr. Stephens' output files and some calculation sheets.

Q. And have you now reviewed those documents?

A. I have.

Q. And are you now prepared to state what you understand to be the thrust of Dr. Stephens's testimony, based -- Dr. Stephens's presentation, written presentation, based upon your analysis of those additional documents?

A. Yes.

Q. Very good. Mr. Hansen, what do you underst- -- what is it -- what do you understand that Dr. Stephens was attempting to achieve through his use of models?

A. Well, the attempt was to determine a chloride concentration in the pit waste such that an exceedence of

the WQCC standard for chloride would never be exceeded in a specified aquifer.

Q. Now, in principle you -- do you agree -- in principle, do you agree or disagree with the proposition that there would be some level that would meet that goal, some level of chloride concentration would meet that goal?

A. Yeah, given a specific conceptual model, I would agree.

Q. Okay. Now what was the -- what was Dr. Stephens -- what do you understand was Dr. Stephens's -- Well, before I go on, I want to use the term -- I want to use a term here to describe what we're talking about, and I want to be sure we understand what that term is, and I'm going to use the term "no-exceedence level". Is that a -- is that an acceptable term to you?

A. Yes.

Q. And what do you understand I'm suggesting by that, so everybody will be on the same page?

A. Well, that would be -- in this particular case, given Dr. Stephens' modeling assumptions, it would be approximately 184 milligrams per liter in groundwater. That is 250 milligrams per liter, the WQCC standard, minus the assumed 66 milligrams per liter naturally occurring chloride.

Q. Okay. Now, that is the difference between the

WQCC standard and what Dr. Stephens assumed to be the background, right?

A. That's correct.

Q. Okay. Now I'm going to use another term that I'm going to call the protective concentration, and by that I mean the concentration in the waste that would be equal to or less than the no-exceedence level when it reached the groundwater. Do you understand that?

A. Yes.

Q. And by that I mean when it reached the groundwater at maximum, because I understand that it won't immediately go to that level, right?

A. Correct.

Q. Okay. So I'm -- for that term I'm going to use -- well, let's see, what term did I say?

Protective level -- Have you got a term to suggest?

(Laughter)

A. Well, I think protective level is appropriate --

Q. Okay --

A. -- given --

Q. -- okay --

A. -- the proceedings.

Q. -- very good.

Now what did Dr. Stephens conclude, based on his

modeling, was the protective level?

A. It was 24,839 milligrams per kilogram in the pit waste.

Q. In the pit waste?

A. Yes.

Q. Now, do you -- given the assumptions and input parameters that Dr. Stephens used, do you disagree -- do you disagree with his modeling?

A. Prefaced on assuming his input model -- input parameters were appropriate, which I think we're going to discuss how they were not, but given that assumption, yes.

Q. Okay, now I want to go -- to call your attention to -- and you have the -- do you have the ability to bring these things up on the computer here? I would like to call your attention to page 10 of industry committee's Exhibit Number 3, which is Dr. Stephens' narrative paper.

Looking at the chart on page 10, what do you understand to be -- what do you understand that Dr. Stephens was trying to do with that chart?

A. He's trying to represent at the no-exceedence level in terms of a synthetic precipitation leaching procedure or SPLP concentration, versus a mixing ratio, a soil mixing ratio.

Q. Now if the waste that had the protective -- Dr. Stephens's posited protective-level concentration of 24,800

milligrams per kilogram, if you did an SPLP leachate test on that waste, what would be the concentration in milligrams per liter?

A. Be approximately 1240 milligrams per liter.

Q. Now is that in accord with the first line -- the top line on the chart?

A. It is.

Q. Now, Mr. Hansen, when you stabilize waste before emplacement, does the concentration that you need to use -- that you properly should use for modeling, the transport of contaminants in that waste to groundwater, does it depend on the concentration of the pollutant in the raw waste or the concentration of pollutant in the treated waste?

A. It would be in the treated waste.

Q. Okay. If you, prior to emplacement, stabilized the stabilized the waste that had -- Well, let me back up. I'm asking this question the wrong way.

If you took waste and stabilized it at a one-for-one ratio, one unit of waste and one unit of clean solvent, and if that waste, as stabilized, had a concentration of 24,800 milligrams per kilogram, what concentration would you get in an SPLP leachate chloride standard from that waste?

A. It would be 1240 milligrams per liter.

Q. Okay. What if you stabilized waste at a 2-to-1

ratio and the stabilized waste had a concentration of 24,800 milligrams per kilogram? What result would you get with your SPLP leachate?

A. It would be 1240 milligrams per liter.

Q. I think I see a pattern developing here. If you stabilized it 3-to-1 or 4-to-1, and the stabilized waste had a concentration of 24,800 milligrams per kilogram, what result would you get from your leachate test?

A. 1240 milligrams per liter.

Q. Okay. Now Mr. Hansen, if Dr. Stephens was taking an SPLP leachate test from the raw waste as opposed to the stabilized waste, would that properly explain the numbers he's used in this table?

A. Yes.

Q. Now what do you understand to be the significance of the 3720 near the bottom?

A. That's an average of the SPLP leachate test results for raw -- or untreated pit waste.

Q. And do you understand -- do you understand that to have some relationship to the 3500 number used in the industry committee's recommendations?

A. It's my understanding that that was a rounding off of that average.

Q. Now then, I'm going to ask you to look at a page from the industry committee's recommendations, and this is

in the -- it's not actually designated an exhibit, but it's in the first -- behind the first tab in the industry committee's notebook, and it's on page 12.

May I approach the witness to show the witness the text?

CHAIRMAN FESMIRE: You may, sir.

MR. BROOKS: Thank you.

Q. (By Mr. Brooks) And this is in section B, subsection (2) -- well -- yeah, that's it. And if I have handed you the right page, what I'm calling your attention to is the industry committee's version of the standard to be applied for closure of pits for waste -- waste testing for closure of pits in place.

A. That's correct.

Q. Okay. Does the industry committee recommend that their 3500-milligram-per-kilogram test be applied to the raw waste or to the treated waste?

A. They use the phrase, stabilized pit contents.

Q. Does that mean they're applying it to the treated waste?

A. I would assume that's the treated waste.

Q. Okay. If they're applying it to the treated waste, is that going to be equivalent to the protective level that Dr. Stephens computed of 24,800 in the waste, or is it going to be a lot larger?

A. It's going to be a lot larger.

Q. If you have 3500 milligrams per kilogram in the treated waste, by SPLP test, what -- milligrams per liter in the treated waste, by SPLP test, what level of chlorides will you have in the treated waste in milligrams per kilogram?

A. It would be 70,000 milligrams per kilogram.

Q. And not 24,800?

A. That's correct.

Q. Thank you. Okay.

Now Mr. Hansen, I asked you earlier did you disagree with Dr. Stephens's conclusions, given his input? And I believe you said you would not, but you emphasized a qualification.

A. That's correct.

Q. Are there certain parameters that Dr. Stephens used in his modeling with which you disagree?

A. Yes, there are two primary input values that I would say are flawed. One is --

Q. Now, you -- I think you said there were two that you used that you think were flawed. Is that correct, or --

A. That's not correct.

Q. Were there possibly some that Dr. Stephens used?

A. Yeah, Dr. Stephens used.

Q. Okay, what were they?

A. One is, a very thick mixing zone depth was used. And the other is, a very low infiltration rate was used for a no-liner scenario.

Q. That is to say, you think it was a low infiltration -- it was an infiltration rate which would be too low for a no-liner scenario?

A. That's correct.

Q. Okay. Now going back to the first one, let's talk a few minutes about the mixing zone. And I have not numbered the rebuttal exhibits, which I should have done, but the first one is this --

CHAIRMAN FESMIRE: Why don't you take the time to do that?

Q. (By Mr. Brooks) Yeah, the first one is this diagram, if you could bring that up on the screen. The one that says section view and plan view. We'll label that Exhibit 1 -- Rebuttal Exhibit 1.

Now, do you recall, Mr. Hansen, that this was on the screen earlier?

A. Yes.

Q. But we didn't offer it in evidence at that time?

A. That's correct.

Q. Where did this come from?

A. This came from the user's manual, the Sharp,

Hansen and others user manual for the MULTIMED model.

Q. Now we've already been over this one time before, and I don't want to indulge in vain repetition, as the heathen do, but would you very briefly once again refresh our recollection about the concept of mixing zone and how it applies to -- how it applies in assessing groundwater contamination?

A. Yes. Well, as we can see, this is a cross- -- represents a cross-section of a waste facility, and the vadose zone underneath that waste facility, and then an aquifer underneath the vadose zone.

As a potential release comes from a waste facility through the vadose zone, it will mix in the aquifer. This area where it mixes in the aquifer is called the mixing zone.

Q. And why does the mixing zone have that characteristic shape that's shown on there?

A. Well, this particular cross-section has a groundwater flow direction from left to right, so we have groundwater flow coming in from the left to the right, through the aquifer.

As that groundwater flows from left to right in this cross-section, it will pick up some contaminants. But as it goes on, more contaminants can come in over that length of that particular waste facility.

Q. And is the shape of the mixing zone determined by the fact that contaminants are being moved down by gravity but simultaneously being moved along the gradient by the current?

A. That's correct.

Q. Okay. Now Mr. Hansen -- Well, first of all, what do you understand to be the mixing zone that was used by Dr. Stephens?

A. My understanding is that the full thickness of the aquifer, which is 50 feet.

Q. Which was assumed to be 50 feet?

A. Was assumed to be 50 feet, yes.

Q. Okay. Now Mr. Hansen, you have been charged with using a mixing zone of four inches. How do you plead, guilty or not guilty?

A. I'm not guilty.

Q. Would you please explain?

A. Okay. I performed a sensitivity analysis on a particular infiltration rate. I might mention that the infiltration rate is a very strong governing factor for the depth of the mixing zone, and the particular infiltration rate that I used to make my sensitivity analysis was 2.3 millimeters per year, which is of course of concern to this case when comparing against Dr. Stephens' 2.5 millimeters per year. I wanted to use as close as I could get, and

that's the number we used for a -- the good liner in the Permian Basin. Dr. Stephens used 2.5 for his no-liner scenario in the Permian Basin.

When using the 2.3 millimeters per year, I determined that the model, MULTIMED model, used 8 feet for a mixing-zone depth.

Q. Okay. Now did you -- did you use the model program itself to derive your mixing zone?

A. Yes.

Q. And does the model tell you what mixing zone it's computed when you tell it to derive?

A. It does not. I'm not sure why they didn't code it differently, but that's the way it is. It uses the default number of .1 meters, and I -- which is equivalent to about four inches.

I have always assumed that if they use that number noted on the output file just as a marker, as an impossibly low number that no one would assume to be an actual mixing zone depth -- from what I inferred from Dr. Stephens's testimony, I think he didn't actually believe it was four inches.

Q. Well, have you now gone back and done some calculations to determine or to approximate what mixing zone depth that the model derived in your modeling?

A. Yes, and that was eight feet.

Q. Very good. Now do you think -- Which do you think is more appropriate? Dr. Stephens' 50 feet, or your eight feet?

A. Well, based on my experience with sampling groundwater at multiple depths in groundwater monitoring wells, there's typically going to be some concentrations throughout a groundwater aquifer, and I will just demonstrate by my highlighting, this is approximately what I used at that 8 feet -- or the model used, I should say -- used the 8 feet for mixing zone depth.

Typically, as -- especially a plume, release plume that has a fairly salt content, meaning it's going to be a greater density than the freshwater aquifer -- it will actually sink down through the aquifer, and just highlighting a theoretical plume here, that might be high in salts.

And as you can see, at a point in a monitoring well, if you sampled at this point in the upper portion you might actually see a low concentration of, say, chloride. And as you sample down at different depths you might see different concentrations, and as you go down through where the plume is actually traveling through the monitor well, you can see a relatively high concentration of chloride.

One significant point I'll make is that I'm drawing -- mentioning chloride, but if there are other

contaminants within that chloride plume, it will follow along with that chloride plume. So other constituents will follow along in that same plume, dissolved constituents.

Q. Okay, so bottom line, you believe that the 8 foot -- do you believe that the 8 foot more accurately characterizes what would probably happen in an actual aquifer?

A. Yes, and that's typically what I see as far as sampling multiple depths through an aquifer.

Q. Okay. Now let's talk about the infiltration rate.

A. Well, the infiltration rate used, 2.5 millimeters per year, is a very low number, and I -- to be used for a no-liner situation. That 2.5 millimeters per year was for a dry area, dry diffuse area for recharge into an aquifer, but not for a moist area underneath a pit that would have moist contents.

I have Dr. Stephens' book on vadose zone hydrology, and I just point to the table on page 112, and --

Q. Which happens to be OCD Rebuttal Exhibit Number 2, correct?

A. -- and to note some recharge in millimeters per year --

MR. BROOKS: I don't think he knows that --

A. That's my impression from the comments I've heard.

Q. Well, it's, I think, what you were presenting here as well.

A. Yeah, all I'm doing here is just simply saying, these are some of the adverse consequences that in the industry reports were raised. Okay?

But I mean, other consequences that I haven't raised is, the state has a finite budget. Okay? And certain amounts will go to OCD and their programs, certain amounts will go to funding health policy and so on. Okay?

I want to make sure that we understand that when you're talking about allocation of resources there are consequences in areas where we have not really thought through, and I hadn't heard that kind of thinking in any of the discussions with regard to the pit rule here. So my point is --

Q. Well, I'm just following along with what you've got, because I'd look at this as what you're presenting is your conclusions that you have based -- you have made based upon -- assuming the work of others, because you're not an economist, you're not a petroleum engineer, you're not a hydrologist, et cetera, or reservoir.

You're basing -- but you're presenting to us conclusions based upon the work of other industry experts

A. That's correct.

Q. And you understand that he assumed that there had been a liner at some time to enable the -- to enable the vegetation to be re-established?

A. That's correct.

Q. So what he was modeling was after the vegetation was re-established?

A. That's correct.

Q. But he gave no weight to the presence of a liner?

A. That's true, and he is assuming a liner will come from the manufacturer in perfect condition, it will be installed perfectly, it will remain intact perfectly throughout that time period.

Q. Now I remember in your direct examination you said something about pit waste being moist?

A. Yes, yes.

Q. And is that significant?

A. It's very significant. If there's increased moisture available for contaminants to be driven down through the vadose zone, it will increase the time and concentration of that contamination to the aquifer.

Q. Now does the HELP model allow for that in computing the infiltration rate at the base of the pit?

A. Yes.

Q. Now you remember Dr. Stephens conceded -- and I

have to point this out, because it's one of the very few things that he conceded -- Dr. Stephens conceded, if I recall, that this encased pit waste would -- that has a liner around it would remain moist, because the liner would prevent the escape of fluids. Is that correct, in your judgment?

A. Yes.

Q. Subject, of course, to the fact that there would be some leakage out of it, some small amount of leakage out of it?

A. That's correct.

Q. Okay. And does the fact that the pit waste remains moist, even though it is buried -- does that have implications for determining the infiltration rate that should be used at the base of the encasement?

A. It does, yes.

Q. And have you allowed for that in your modeling?

A. I have.

Q. And do you understand that Dr. Stephens has made any allowance for that in his modeling?

A. No- -- Yeah, that's what I understand, yes.

Q. Very good.

A. He hasn't.

Q. Is there anything else you would like to say about Dr. Stephens's infiltration rate?

CHAIRMAN FESMIRE: Mr. Hansen, would you please repeat your last answer?

MR. HISER: About what Dr. Stephens did or did not allow.

THE WITNESS: Well, my understanding is, he did not allow for any moisture within the waste.

Q. (By Mr. Brooks) Is there anything else you would like to say about infiltration rates? I realize that wouldn't be allowed in court, but we've done things like that here.

CHAIRMAN FESMIRE: And nobody would have noticed it if you hadn't pointed it out.

THE WITNESS: No.

Q. (By Mr. Brooks) Very good. Did Dr. Stephens articulate some concern that additional chloride mass was being introduced into the computations by something in your modeling procedure?

A. Yes, that was my understanding. He didn't go into much detail, but considering the fact that the MULTIMED model will give you a warning if you try to put in too much chloride mass, and if you'll look at the 42 output files in our Exhibit 20 you won't find that particular warning, I would say that concern becomes moot.

He may have been thinking that our conceptual model lacked some chloride mass. However, there's a big

difference between the assumptions for the two different models used.

One, the -- I'll just start with the -- The HELP model output gives you a rate of leachate release. And what is leachate? Leachate is a free liquid, particularly precipitation in the form of water that comes in contact with waste. That's what we call leachate.

And the MULTIMED input is -- for infiltration rate, is that very same thing. It's the release rate of leachate into the vadose zone.

We also put in, of course, at that time, we put in the concentration within that leachate that's going into the vadose zone. But he -- I looked at some calculations he provided --

Q. Is that Dr. Stephens you're speaking of?

A. Dr. Stephens.

-- after his testimony.

He assumed a chloride concentration over seven times less than what the OCD assumed for the MULTIMED. Now that might be appropriate for the VADSAT model, but not for the MULTIMED model. Big difference, that's the big difference. I think it's just a simple misunderstanding on Dr. Stephens' part, not realizing the difference between those two models.

Q. Well, why would there be a difference between the

two models, and what would be the appropriate --

A. Yeah, so VADS- -- yeah, VADSAT uses a milligrams per kilogram in the waste itself to start its modeling, whereas of course the MULTIMED, as I just described, uses milligrams per liter in the leachate --

Q. Okay, well --

A. -- the waste facility --

Q. -- that's a good lead-in to my next question, if you're through with your explanation --

A. Well, I'll just -- I think he came up with something like a difference of .38 times less than what he thought it should be.

Compare that to seven times of what we really had. The difference between that .38 and our seven leads us to conclude that for our conceptual model we had more than ample chloride mass.

Keep in mind, we only used 50 years for a release pulse. That 50 years gives us plenty of chloride mass, plenty of time -- and we're using a relatively small amount of water, that is, millimeters per year -- that gives us plenty of time for that chloride mass to dissolve into leachate.

Q. Okay. Well, my next question was going to be, there seemed to be some confusion about what you did in your modeling, because each of your tables in your exhibit

begins with a concentration in milligrams per liter, correct?

A. That's correct.

Q. Now is that concentration in milligrams per liter, is that a concentration determined by an SPLP test?

A. It is not.

Q. Explain what it is.

A. It is the concentration in the leachate that would be released from a pit.

If you have -- say we had a concentration of 1000 milligrams per liter as one of our models, that would equate to 1000 milligrams per kilogram soluble chloride in the waste.

We're assuming that if the waste has 1000 milligrams per kilogram in the waste, we -- with a relatively small amount of water -- and given the time that we're using -- that's millimeters per year, we're talking a very small amount of water over a year -- it will have ample time to dissolve all of that 1000 milligrams per kilogram into a free liquid milligrams per liter.

Q. But it wouldn't dilute it 20 to 1?

A. It was not diluted 20 to 1.

Q. Okay. In fact, you're assuming that it would be approximately equal, are you not?

A. Yes.

Q. Equal, that is, to the concentration -- actual concentration in the waste?

A. Right, of soluble chlorides, yes.

Q. Right. It would not include the insoluble -- the chloride that's not soluble?

A. No, and our testing -- proposed testing requirements only involves soluble chlorides.

Q. So then would the levels that you assumed, would they correspond in terms of units to the levels detected in the OCD testing program?

A. With a 20-to-1 dilution, yes.

Q. Well, would they correspond -- Now you've got me confused, because --

(Laughter)

Q. -- I understood you to say that your concentration in the leachate would be approximately equal to the concentration in the waste.

A. That's correct.

Q. The concentration in the leachate that you used in your modeling?

A. Yes.

Q. And the concentration in the waste, did you say that would be only for soluble chlorides?

A. Yes.

Q. And the concentration levels determined by the

OCD in their sampling program, would that apply to total chlorides, or only to soluble chlorides?

A. Well, our -- I thought the question was, what in our proposed testing method for disposing of --

Q. No --

A. -- pit contents --

Q. -- no, I'm sorry, that was not the question.

I was saying, does it -- do the concentrations that you used in your model -- are they directly comparable to the concentrations in the OCD's testing program?

A. Yes.

Q. Thank you.

Now, there has been some criticism of your use of Dulce, New Mexico, weather data for purposes of establishing our modeling parameters. Do you recall that?

A. Yes.

Q. Have you looked into the question of whether or not Dulce, New Mexico, is considered to be a part of the San Juan Basin?

A. I have.

Q. Okay. Well then, would you bring up your -- what we -- will be marked -- the geologic map that we will mark as OCD Rebuttal Exhibit Number 3?

Okay, now what is this, what is OCD Rebuttal Exhibit Number 3?

A. This is the United States Geological Survey Professional Paper Number 1420, showing the -- I'm sorry -- San Juan structural basin, and --

Q. Can you locate Dulce, New Mexico, on that map?

A. I can. What I use as a little indicator is that little notch in the state line between Colorado and New Mexico, that little notch. And so that puts Dulce right about there.

Q. So according to this map, then, is it in what USGS has mapped as the regional aquifer analysis study area in the San Juan structural basin?

A. That's correct.

Q. Okay. Then have you also determined whether or not there are gas wells in the vicinity of Dulce, New Mexico?

A. Well, what I did was to determine the location of the closest sampling points that OCD made for pit contents this last spring.

Q. And we will mark what you have on the screen as OCD Rebuttal Exhibit Number 4, and will you tell us what that shows?

A. Yes, here I'll point to -- the laser pointer is the location of Dulce, New Mexico. Note the notch in the state line there.

The darkened portion is the Jicarilla Apache

Indian Reservation boundaries, and the other two points labeled TC-01 and DP3-06 are two sampling points that OCD used for our pit sampling events. We used these not because they were close to Dulce, just that these are two points that the District Office identified as recently being completed or being drilled sites.

I didn't actually realize how close they were to Dulce until I looked at this map that I put together.

This range between Dulce and TC-01 --

Q. Now --

A. -- is approximately 18 miles.

Q. -- is that TC or T3?

A. T3, sorry.

Q. Okay, go ahead.

A. T3, thank you.

Q. And it's approximately 18 miles?

A. 18 miles, according to Google Earth.

CHAIRMAN FESMIRE: So we can't tell whether the witness is dyslexic or needs new glasses.

THE WITNESS: Probably a little of both.

And DP3-06 is approximately 32 miles as the crow flies.

Q. (By Mr. Brooks) And those are in a south -- a southwest --

A. That's correct --

Q. -- direction --

A. -- yes.

Q. -- from Dulce?

A. Yes.

Q. Now do you have some pictures -- Are the remaining slides you have here pictures of those analysis sites?

A. Yes -- yeah, this is the D3 -- sorry, DP3-06 site. And I put these photographs just to note that it's in a forested area.

If you look back at the ridge, and of course the trees in the foreground, that particular person there is me. I didn't actually take the photos, but I was there at the time the photos were taken.

CHAIRMAN FESMIRE: Mr. Hansen, the guy leaning on the fencepost is not an OCD employee?

THE WITNESS: No, it's --

(Laughter)

Q. (By Mr. Brooks) Well, we will mark these as OCD Rebuttal Exhibits 5, 6, 7, 8 and 9.

A. Another of the same site, just to indicate forested area.

CHAIRMAN FESMIRE: Mr. Brooks, you're going to have to be a little more specific, they're not in that order in our stuff.

Q. (By Mr. Brooks) Okay. Well, is this the first one you've shown, Mr. Hansen?

A. No, sorry.

Q. Well, let's go through them and let's identify each one specifically. Let's start with the first.

A. We could start with this one and work back.

Q. That's fine. Since mine aren't stapled, I can start with any one you want to.

A. All right.

Q. Okay, and this one is the one that has the back of the truck open, so we'll call that OCD Exhibit Number 5 -- Rebuttal Exhibit Number 5.

CHAIRMAN FESMIRE: Mr. Brooks --

MR. BROOKS: Yes?

THE WITNESS: It is labeled.

CHAIRMAN FESMIRE: DP3-01-2 -- We've got it, but it's somehow been inverted.

THE WITNESS: I just happened to see that --

MR. BROOKS: That does appear to be the case, and I know that can be done with photographs, and so it doesn't -- it's also been elongated as well as inverted. So the printed-out versions are somewhat distorted.

Q. (By Mr. Brooks) And which one would you like to call Exhibit Number 6?

A. The one currently shown on the screen, DP- --

Q. Okay, well now, I've marked that as 5.
A. Okay, sorry. Sorry. All righty.
Q. Get us another one if you would, please.
Okay, I have that one, but it's also inverted. I'll call that number 6.
Okay, now --
MR. HISER: Which one is this?
MR. BROOKS: This is Number 6.
MR. HISER: What was Number 5?
MR. BROOKS: Number 5 was the other one with the truck with the back open.
Q. (By Mr. Brooks) Now are you in this picture number 6, Mr. Hansen?
A. Yes.
Q. Okay, then let's bring up another one.
A. This photo labeled T3-01-3, I'm in this photo here.
Q. And we'll call this OCD Exhibit Number 7.
A. And this is of the T3 site, and just wanted to note that this particular site is in a forested area.
Q. Yes, I believe we have made our -- shown everything that's really material in these photographs, Mr. Hansen, so I think I will withdraw the other two --
A. Okay.
Q. -- in the interest of time.

Now Mr. Hansen, when you put together this -- when you assembled your data, were you trying to get an average for the producing regions, or were you trying to get an area that -- a means of computing what would happen and -- not necessarily a worst-case scenario, but perhaps a worse-than-average-case scenario here?

A. Well, worse-than-average case, yes.

Q. So in each basin you selected an area that was on the wetter side of the basin, right?

A. That's correct.

Q. Was there anywhere else in the western part of -- in the western end of the San Juan Basin where you would have been able to get adequate weather data, other than Dulce?

A. Well, in the eastern part, no. In the western --

Q. I'm sorry, I meant the eastern part. I -- You took from the eastern part of each basin, right?

A. Yes.

Q. And was there anywhere else in the eastern part of the San Juan Basin where you would get -- where you had adequate weather data?

A. No.

Q. Okay. Now that's all I have on that subject. There's one other subject I want to ask you a question about.

There has been a question raised about the -- Well, I'll go ahead and ask this. We had debated whether this was even worth going into or not, but remember Mr. Mullins suggesting that you should have used solar radiation from Albuquerque instead of Pueblo -- as opposed to Pueblo, Colorado?

A. That's correct.

Q. Did you do a sensitivity check on that to determine how much difference that would make if you had done that?

A. I did. It was approximately 3.8 percent less using Albuquerque, rather than Pueblo site.

Q. Thank you. Now the other question I wanted to ask you -- and would you believe I've lost the statutory reference papers? No, I haven't. I thought I had.

Do you have a copy of this, or do I need to -- Solid Waste Act, or do I need to bring you a copy?

A. I have a copy.

Q. Okay. Mr. Hansen, some people have raised -- some testimony of some of the witnesses has implanted a question here as to whether or not the solid waste facilities existing in the San Juan Basin that are regulated by the Department -- by the Environment Department would continue to be available for disposal of oil and gas waste -- oil and gas pit waste, after the

expiration of the memorandum of understanding that's currently in effect. Do you recall that testimony?

A. Yes.

Q. Now I want to be careful here, because I'm not asking you to give an opinion of law, but I'm going to ask you about some statutes and rules.

Now you have worked for the Oil Conservation Division for how long?

A. Approximately 14 months.

Q. And before that, for whom did you work?

A. I worked for the Environment Department in their solid waste bureau for approximately 15 years.

Q. So you -- Do you have some familiarity with how the solid waste bureau interprets the statutes and rules that they administer?

A. I do.

Q. Okay. Now I'm going to ask you to look, and you said you had a copy, at Section 74-9-43 of the New Mexico Statutes, and I will ask you to read subsection A of that statute. I think this time you should probably read aloud --

A. Okay.

Q. -- since everybody doesn't have a copy.

A. All right. A solid waste facility may accept a -- for disposal nondomestic waste. For purposes of this

section, in quotes, nondomestic waste means waste associated with the exploration, development, production, transportation, storage, treatment or refinement of crude oil, natural gas, carbon-dioxide gas or geothermic -- - thermal energy, but does not include drilling fluids, produced waters, petroleum liquids, petroleum sludges, or, except in the event of an emergency declared by the Director of the Oil Conservation Division of the Energy, Minerals, Natural Resources Department, petroleum-contaminated soils associated with the exploration, development, production, transportation, storage, treatment or refinement of crude oil or natural gas.

Q. Okay. Now as this is interpreted by the solid waste bureau, to the extent you're familiar with their interpretation, would they consider pit waste to be drilling fluids, produced waters, petroleum liquids or petroleum sludges?

A. They would not.

Q. Would they consider it to be petroleum-contaminated soils?

A. No.

Q. Very good. Now these particular nondomestic wastes that are authorized to be accepted by 74-9-43, do the Oil Conservation Commission rules authorize the Oil Conservation Division to authorize --

CHAIRMAN FESMIRE: Hang on, Mr. Brooks.

MS. FOSTER: I would just like to state for the record that these questions are extremely legal in nature in terms of asking this witness the legal -- and his interpretation of the definitions in statute and in rule, and I intend to cross-examine him on that, so I'm going to -- I'm making this objection now, or at least this statement now, so that later on when he objects to it and you overrule me, the record is made.

Thank you.

CHAIRMAN FESMIRE: Ms. Foster, you're always aware that at any time an objection is overruled you can make a record.

MS. FOSTER: I understand that, but since we're here at this point right now and he's specifically asking him about his legal interpretation of what's in the regulation or another statute, I just want to highlight the fact that later on when I ask these questions, if this issue comes up, then it's already been highlighted, that's all, since we're here.

MR. BROOKS: Thank you.

MS. FOSTER: Thank you, sir.

CHAIRMAN FESMIRE: I must have missed that day in legal procedure.

MR. BROOKS: I am, however, going to withdraw

that last question because I think the previous question is the only one I really needed to ask, and at this point in the proceeding, I'd prefer not to ask questions I don't think I need to ask, so --

CHAIRMAN FESMIRE: Okay.

MR. BROOKS: -- I will withdraw that last question, and at this point in time I will pass the witness.

Oh, I'm sorry, I forgot to offer the exhibits.

CHAIRMAN FESMIRE: Okay.

Q. (By Mr. Brooks) Mr. Hansen, OCD Rebuttal Exhibits Numbers 1 through 3, were those obtained by you from published sources as previously identified -- well, I'll include 4 in that too. Were those obtained by you from published sources?

A. Yes.

Q. And the annotations on Exhibit Number 4, were those made by you?

A. Yes.

Q. And the pictures, Exhibits 5, 6 and 7, were you present at the site when those pictures were taken?

A. I was.

Q. Do they fairly and accurately represent the scene?

A. Other than being the mirror image, they do.

Q. And the elongation, perhaps, also.

A. Perhaps the elongation, yes, sir.

MR. BROOKS: Offer OCD Rebuttal Exhibits 1 through 7.

CHAIRMAN FESMIRE: Is there any objection?

MS. FOSTER: No objection.

CHAIRMAN FESMIRE: Seeing no objection, OCD Rebuttal Exhibits 1 through 7 will be admitted to the record.

Mr. Brooks, do you pass the witness?

MR. BROOKS: Pass the witness.

CHAIRMAN FESMIRE: Mr. Hiser?

MR. HISER: I do have a couple of questions.

CROSS-EXAMINATION

BY MR. HISER:

Q. Now Mr. Hansen, I want to start with what you just went through in rebuttal, and then I want to ask you, I think, two or three questions with regard to your direct testimony, since we had agreed that I would just sort of wait till we got to this point.

In your model outputs -- and I don't know if you have those available that you could put them back up on the screen for all of us to look at, or at least an example of one of your output runs?

A. Not having access to our Intranet, I don't

believe I do.

Q. Okay. And I don't know that I actually have a copy of one of your --

A. Wait a minute, maybe --

Q. Okay. So when we're talking about the -- so when we're talking about your mixing zone value and I look at your -- is it the MULTIMED model that that would be found in; is that correct?

A. I'm sorry, could you repeat that? I was looking for --

Q. That's okay, I'm sorry.

When I'm looking at the mixing zone that you're talking about, that's in the MULTIMED model; is that correct?

A. That's correct.

Q. And if I look at the charts that you've provided for here, that number that I'm -- the number that I would be looking at is under what variable name? Is it --

A. Source -- source depth, source --

Q. Source thickness --

A. -- thickness, thank you.

Q. -- mixing zone depth in parentheses?

A. Yes, thank you.

Q. Okay. And that's a value that's given in meters, correct?

A. That's correct.

Q. And then you said that you used the derived methodology --

A. Yes.

Q. -- is that correct? And then it reported a .1, and it's your contention that that's a program thing and not what the programmer actually used?

A. It notes --

CHAIRMAN FESMIRE: Mr. Hiser, I think we can get a copy of that if you still -- still need it.

Wayne, do you have it?

MR. PRICE: I think I have it on my stick.

MR. HISER: I'd be happy to wait, if that would be helpful for the Commission.

CHAIRMAN FESMIRE: Why don't we go ahead and take a 10-minute break and allow Mr. Price to load that up.

MR. HISER: Thank you, Mr. Chairman.

(Thereupon, a recess was taken at 2:25 p.m.)

(The following proceedings had at 2:37 p.m.)

CHAIRMAN FESMIRE: Okay, back on the record.

Let the record reflect that this is again the continuation of Cause Number 14,015, that all three Commissioners are present, we have a quorum.

And I believe, Mr. Brooks, you were --

MR. BROOKS: I had passed the witness.

CHAIRMAN FESMIRE: Mr. Hiser was about to begin the -- well, had just barely gotten into the cross-examination of Mr. Hansen.

MR. HISER: That's correct, thank you, Mr. Chairman.

Q. (By Mr. Hiser) Now Mr. Hansen, you testified that you believe that the model actually used about an 8-foot mixing depth; is that correct?

A. I know that's what it used, yes.

Q. Okay, and what would that number be in meters, which is the terminology that's used by this model?

A. About 2.2 meters or --

Q. So somewhere around 2.2 meters.

Now if I turn and look at the output here and I look at, for example --

MR. BROOKS: Excuse me, what page are you on, Mr. --

MR. HISER: I'm trying to determine that from this screen here.

THE WITNESS: Thirty-four.

MR. HISER: This is page 34 of 422.

MR. BROOKS: Thank you.

Q. (By Mr. Hiser) Okay, and we can see a number of the different input parameters that you used in this model; is that correct?

A. That's correct.

Q. Okay. Now a number of these -- for example, the overall chemical de-cake coefficient, which is on the top of, I think, the page preceding that, but there were a couple -- oh, there it is -- and all that, also show that they're derived. And in that case it shows a negative 999, negative 999. And what does that double negative 999 mean?

A. That means a value was not entered for that parameter.

Q. Okay, and so if a value is not entered for that parameter and it shows a negative 999, then what conclusions could we draw when we go down to the mixing depth or the source, and we do see a number, in fact, appearing in that?

A. A coding difference between those two different parameters.

Q. So you believe this is a coding difference and that, in fact, it was using an 8-foot mixing zone?

A. Yeah, from attending training sessions and EPA Regional Office in Dallas, that's --

Q. And what would be the mixing depth if you used a no-liner assumption, with your model, MULTIMED?

A. Well, I didn't do analysis on that, so I --

Q. Would it be greater or less than --

A. It would be greater.

Q. And how -- do you have a sense of how much greater?

A. I couldn't come up with a number off the top of my head, but it would be greater.

Q. But it would be greater?

A. Yes.

Q. Now in your testimony you said that other constituents will follow the chloride along; is that correct?

A. Well, will be in that plume, yes.

Q. Will be in that plume. So are you testifying they will arrive in the groundwater at the same time as the chloride?

A. Not necessarily, no.

Q. And in fact, would those constituents sort of traverse that soil column based upon a number of other factors related to adsorptivity and dispersion and biodegradation and a series of other processes of that nature in the soil column?

A. That's correct.

Q. And so the chloride plume, or the wetting front, as it's sometimes been called, represents sort of the worst-case maximum mobility that you intend to see after a given time period?

A. Depending on the constituent, yes.

Q. That's why it's used as a tracer?

A. Yes.

Q. Now you also testified that Dr. Stephens had assumed dry soil in the pit. How did you come up with that conclusion?

A. Well --

Q. Is that, am I to assume, perfectly dry? What is perfectly dry?

A. I don't know if I said perfectly dry, but that moisture wasn't taken into consideration when determining the infiltration rate.

Q. So your testimony is that Dr. Stephens' model did not consider the amount of moisture in the pit when he was doing his modeling; is that correct?

A. As it relates to the infiltration rate, his assumption of the infiltration rate.

Q. Because he used the regional infiltration rate to come up with a number that he was moving down in the soil column; is that correct?

A. My understanding was that -- for a dry, diffuse area, yes.

Q. And what's the relative volume of the pit versus the soil column underneath it?

A. As far as --

Q. Well, you have a pit --

A. -- given a --

Q. -- which we've talked about. They can be in size anywhere from less than 100 by 100 to about 150 or 200 by 200, and your rules specify that there's a depth to groundwater of at least 50 feet beneath that pit, and the pit ranges in size, I think we've heard testimony before, to 10 feet in depth.

What would be the relative volumes of the area in the pit and underneath the pit?

A. One to 4?

Q. And so is it your testimony, then, that the moisture from the pit is going to thoroughly saturate or bring up the entire volume in the area underneath the pit to the level of what the it was? Is that what you're contending in your modeling?

A. I'm not sure what you're asking, but --

Q. Well, I'm trying to understand what -- the amount of moisture that you believe is appropriate in the model that you used from the base of the pit to the aquifer, and you've stated that you believe that Dr. Stephens inappropriately used too little moisture and that there needs to be more moisture and that it needs to be related to the amount that's in the pit.

And so I'm trying to understand if you took that moisture level and projected it all the way down, then, to

the groundwater or the aquifer.

A. No -- no, there's a misunderstanding. The moisture is taken into effect to determine how much will leak out of the bottom of that moist area, and that's the number that HELP calculates.

Q. Correct. Now, but -- And you used that as a constant number; is that correct? Or did it vary over time?

A. Well, there was a 50-year pulse that we used for the contaminant migration.

Q. I'm trying to figure out where the water came from, Mr. Hansen. Help me, where the water's coming from.

We have a certain amount of moisture in the pit, correct?

A. Cor- --

Q. And then we have a cap and evapotrans- -- or a liner and an evapotranspiration cap on top, or a cover on top of that, which may not be -- but there's plants and vegetation as the rule is coming from.

So where is the -- where is the additional water coming from once you exhaust the water that may have been in the pit?

A. Well, you always have a steady input of precipitation over that moist area, and that's what the HELP model calculates. It takes into account that moist

area with the precipitation coming on to it, and it will give you what leachate will come out of that moist area.

Q. Okay, I think I understand.

What did you use for the moisture under the pit?

A. Well, then you go to MULTIMED, and you input residual moisture. I think they used about 11 percent.

Q. Okay, and so that was based on the surrounding soils, then, would be the standard moisture that you would use for that?

A. Yes.

Q. Okay. And then you said that you were looking at the salt and having come through. Did you assume 100-percent saturation of the water as it went through the pit? Saturation with the salt?

A. Well, I'm not --

Q. In other words, did a hundred percent of -- that the water dissolved 100 percent of the salt that it came in contact with?

A. Yes, yes.

Q. And did you consider saturation limits on how much salt the water can hold?

A. Yes.

Q. On the Dulce site, which aquifer is Dulce actually in?

A. Well, I'm not sure what aquifer. I know it's in

the San Juan River basin.

Q. Do you know whether there's any production out of that aquifer?

A. I don't.

Q. Okay. Now you stated in the overall modeling that you did that you tried to choose reasonable worst-case assumptions; is that correct?

A. That's a good paraphrase, yes.

Q. Okay. And how many of the different parameters on this model did you do that with?

A. I couldn't say the number, but I will say most.

Q. And what happens if you add a reasonable conservative assumption on top of a reasonable conservative assumption on top of another reasonable conservative assumption, and then yet another one and another one, for most of the variables in the model?

A. Well, each reasonable conservative assumption will be evaluated on its own, so there's no cumulative effect, if that's what --

Q. How did you avoid cumulative effect?

A. Of the reasonable assumptions?

Q. Yes.

A. Well, it's a function of the model's --

Q. Okay, explain that to me, because typically models are driven by the input parameters. And so are you

saying that you used a standard default parameter for everything and then just varied one each time, and that you've presented us as many models as are different input parameters?

A. No.

Q. So did you use a number of the reasonably worst-case assumptions in the same model run?

A. Yes.

Q. And so -- and that doesn't have a cumulative effect. Why?

A. Well, if you change one parameter and maybe another parameter was not as conservative, then they would tend to cancel each other out.

Q. Yes, but I thought that you just said that you made most of them the reasonable worst-case assumptions --

A. I --

Q. -- and that would mean that you were looking at maximizing the transport from the pit down into the aquifer, would it not?

A. Well, we were specifically looking, but that wasn't the goal.

Q. Well, that wasn't the goal, but that was the worst case that you were concerned about, was it not?

A. Right.

MR. HISER: Okay, I think that's all the

questions I have.

CHAIRMAN FESMIRE: Mr. Carr?

MR. CARR: No questions.

CHAIRMAN FESMIRE: Ms. Foster?

MS. FOSTER: Thank you.

CROSS-EXAMINATION

BY MS. FOSTER:

Q. Mr. Hansen, getting back to your direct testimony when I believe you stated, Cuttings are not considered hydrocarbon-contaminated wastes for the purposes of disposal at a landfill -- I just want to get back to that line of questioning.

A. Which -- which type of waste?

Q. You were talking to Mr. Brooks concerning the exceptions of wastes into a landfill, an NMED-approved landfill. Remember that conversation?

A. Yes, yes.

Q. Okay, and the NMED landfills, in terms of acceptance of waste, there's a different standard for wastes than there is for the OCD-permitted landfills; is that not correct?

A. I'm not sure what you mean by standard.

Q. Okay. Well, just to make it simple, the NMED landfills will accept what has been termed special wastes, correct?

A. That's correct.

Q. Okay. And I believe that you stated that an NMED landfill could accept sludge and petroleum-contaminated soils?

MR. BROOKS: Objection, that misstates the testimony, I believe.

Perhaps the witness can charact- -- can state it, but I do not believe that that's what the witness testified.

THE WITNESS: Today I have not testified --

MS. FOSTER: Okay.

THE WITNESS: -- as such.

MS. FOSTER: Mr. Chairman, if I could approach the witness, I have taken off the NMED website the definition of what they consider to be special waste management for acceptance at the NMED landfills, and I've made copies for the Commission. You could use this as demonstrative evidence or not, but I would like to talk to him about this issue.

CHAIRMAN FESMIRE: Are you going to establish a foundation for that as -- you know, as to accuracy, or are you just --

MS. FOSTER: Okay, well --

CHAIRMAN FESMIRE: You may approach the witness, and --

MS. FOSTER: Yes,we'll see how it goes and then we'll see if I want to --

CHAIRMAN FESMIRE: That's kind of what I was hinting at.

MS. FOSTER: Thank you.

MR. BROOKS: Do you have a copy for me?

MS. FOSTER: Yes, certainly.

Q. (By Ms. Foster) Now Mr. Hansen, I believe that you testified that you were employed by the -- in the NMED for a while, prior to coming to the OCD?

A. That's correct.

Q. Yes, and you do have experience with the landfills and the permitting process that's done by the NMED?

A. I do.

Q. Okay, and are you familiar with the term "special wastes"?

A. Yes.

Q. Okay. And are you aware that the NMED has a website that has available information available to the public?

A. Yes.

Q. Okay, I -- Looking at this piece of paper in front of you, which I guess we'll call IPANM -- just for demonstrative purposes right now, I don't remember what

number I was up to in my exhibit numbers.

MR. HISER: Make it A.

MS. FOSTER: A, we'll make it A.

Q. (By Ms. Foster) -- is that a fair and accurate representation of what would be on the NMED website?

I believe it's dated on the bottom as today's date -- Oh, actually it's not today's date, it's November 23rd, 2007.

A. I would assume this is correct, yes.

Q. Okay. And reading through that, is that a fair and accurate representation of what you understand to be the definition of special waste, based on your experience with the Environment Department?

A. Yes.

MS. FOSTER: Yes, okay.

At this time, Mr. Chairman, I would move this Exhibit A into evidence, so that I can give the Commission copies of this.

CHAIRMAN FESMIRE: IPANM Rebuttal Exhibit A?

MS. FOSTER: That would be fine.

CHAIRMAN FESMIRE: Okay --

MS. FOSTER: And if I may approach --

CHAIRMAN FESMIRE: -- is there any objection to IPANM Rebuttal Exhibit A?

MR. JANTZ: None.

CHAIRMAN FESMIRE: Seeing no objection, it will be so --

MR. BROOKS: No objection.

CHAIRMAN FESMIRE: -- admitted.

MS. FOSTER: May I approach, Mr. Chairman?

CHAIRMAN FESMIRE: You may, ma'am.

Let's clarify the record, it's IPANM Rebuttal Exhibit A?

MS. FOSTER: Yes, please.

May I proceed, Mr. Chairman?

CHAIRMAN FESMIRE: You may, ma'am.

Q. (By Ms. Foster) Thank you.

Mr. Hansen, discussing the definition of petroleum contaminated soils, which is listed as number 9 under the special waste definition for the -- at the -- on the NMED website page, Rebuttal Exhibit A for IPANM, could you read that number 9, please?

A. Okay, number 9: Petroleum contaminated soils, (PCS) in parentheses, that have a sum of benzene, toluene, ethyl benzene, and xylene isomer concentrations of greater than 50 milligrams per kilogram, or benzene individually greater than 10 milligrams per kilogram, or a total petroleum hydrocarbon concentration of greater than 100 milligrams per kilogram.

Q. Okay. And looking at that definition of

petroleum-contaminated soils, there's no listing in there of a chloride level or a chloride limitation as to what can be considered special waste; is that correct?

A. That's correct.

Q. Okay. And these are special -- these are wastes that can be deposited at NMED-permitted landfills, as opposed to the OCD-permitted landfills, correct?

A. If they're permitted to do so, yes.

Q. If they're permitted to do so, yes.

Now are you familiar with the San Juan regional landfill?

A. I am.

Q. Okay, and I believe there's been some discussion during this hearing as to an MOU or a special understanding between the OCD and the NMED as it pertains to disposal of drill cuttings at the San Juan regional landfill. Are you aware of that MOU?

A. My understanding, it wasn't limited to that particular landfill, but yes.

Q. Okay. So there are other landfills that might be under that MOU?

A. Yes.

Q. Okay. And was that MOU as a result of an emergency declaration by the OCD in order to dispose of the waste at the NMED landfills?

A. I'm not sure it was an emergency declaration, no.

Q. Okay. Well, are you aware of the circumstances surrounding why the MOU is necessary particularly as it pertains to the San Juan regional landfill?

A. Yes.

Q. Okay, could you please tell the Commission why it was that that MOU was needed?

A. Well, it was my understanding that in the northwest, and San Juan Basin in particular, that the type of waste containing chlorides could not be disposed of at a landfarm, so to instruct operators of an alternate disposal area this memo was developed.

Q. Okay, so it was a concern with the chloride levels in the disposal of landfarms, correct?

A. That's my understanding.

Q. Okay, I don't want to put words in your mouth.

Okay, are you familiar with Rule 36 or the surface waste management rule that was promulgated by the OCD and passed as of February 14th, 2007?

A. Yes.

Q. Okay. And do you know what the chloride standards or limitations are as they pertain to landfarms?

A. Not off the top of my head, no.

Q. Okay. Well, does the number 500 milligrams per kilogram chloride if the groundwater is less than 50 feet

-- does that ring your bell at all?

A. That --

Q. Or do you recall?

(Laughter)

Q. Sorry. Do you recall that number at all?

A. That -- that does ring my bell a bit.

(Laughter)

A. That sounds familiar, yes.

Q. Okay. And then of course if the groundwater is 100 feet -- in other words, deeper than the -- then it's a higher chloride standard of 1000 milligrams per kilogram?

A. That also rings my bell a bit, yes.

Q. Okay. All right. So I guess what I'm trying to get at, then, is, landfills that are permitted by NMED will take chloride -- petroleum-contaminated soils, irregardless of the chloride level, but the OCD landfarms have a limitation based on chlorides; is that correct?

A. That is correct. However, the type of waste that would be diverted from a landfarm would be considered as an industrial waste by the solid waste management facility -- sorry, by the municipal solid waste management facilities.

Q. Okay, so then it would be considered industrial process waste?

A. Well, it's called industrial solid waste, but yes.

Q. Okay. And do you know which landfills would actually accept industrial solid waste, then?

A. Yes, the San Juan regional landfill, the Rio Rancho landfill, the northwest New Mexico regional landfill -- I'm just thinking in the northwest portion of the state.

Q. Okay. Well, actually, that's quite a few for the northwest, and that's really where my concern is.

Let me ask you this. Where is the northwest regional landfill?

A. That's near Prewitt, New Mexico.

Q. Prewitt?

A. Prewitt, in between Grants and Gallup.

Q. Okay, and is that an NMED-permitted landfill?

A. It is.

Q. Okay, when was that permitted?

A. Oh -- sorry, I'm going to say -- this is just an approximation from my memory, I'm going to say around 1996.

Q. Okay. Does the NMED have a list of landfills accepting special waste or industrial process waste on their website?

A. Yes.

Q. Okay.

A. They should.

Q. They should?

A. Right.

Q. Okay.

A. Last I knew.

MS. FOSTER: Well, if I may approach the witness, I have another document from the NMED website that I would like to show him to discuss.

CHAIRMAN FESMIRE: You may.

MS. FOSTER: Thank you.

Q. (By Ms. Foster) Okay, Mr. Hansen, based on your experience with the Environment bureau, does that document look familiar to you at all from their website?

A. Yes.

Q. Okay, and that document discusses landfills that accept special waste; is that an accurate representation of what that document is?

Q. Okay. And is the northwest landfill on that list as an NMED website -- -permitted landfill?

A. Well, yes, in that it is referred to here on this list as the Red Rocks regional landfill.

Q. Okay.

A. Otherwise know as the northwest New Mexico regional landfill.

Q. Okay. All right, so the name has changed, that's why I couldn't find it. Okay, but it is on that list, and we're talking about the same landfill then?

A. Yes.

Q. Okay. Now you stated earlier in your testimony that you were actually present for the sampling in the northwest, correct?

A. Correct.

Q. And do you recall -- and if you don't, I can show you IPANM Exhibit Number 5 -- do you recall the average chloride levels that your soil sampling had from your wells up in the northwest? And if you don't --

A. Well, as I recall, it was around 3800 milligrams per kilogram.

Q. Okay. Well, maybe I should refresh your recollection with IPANM Exhibit Number 5. May I approach the witness?

CHAIRMAN FESMIRE: You may.

Ms. Foster, I'm still waiting for you to make an offer of proof in the case that will be appealed *de novo*, though.

MS. FOSTER: An offer of proof? For -- ?

CHAIRMAN FESMIRE: Never mind, just --

Q. (By Ms. Foster) Mr. Hansen, does that refresh your recollection?

A. (No response)

Q. Now, Mr. Hansen, before you answer the question, I was just informed by Mr. Mullins, who prepared that exhibit, that actually he -- your average of 3800 is

approximately correct, and that the numbers that are on Exhibit 5 were the numbers that were from the sampling, okay? So...

A. Okay.

Q. Okay. The reason I wanted to have you highlight the number -- the average chloride levels would be based on the conversation that we've just had, if an operator ends up with the 3800 chloride levels, they would not be able to bring those wastes to a landfill -- landfarm; is that correct?

A. That's my understanding, yes.

Q. Okay, and therefore they would have to bring it to a landfill?

A. Yes.

Q. Which in the northwest is the NMED-permitted landfills, including the San Juan regional?

A. Within New Mexico, yes.

Q. Yes. And the MOU that we discussed earlier, that expires in April; is that correct?

A. Well, I'm not sure what you mean by "expires". I --

Q. Okay. Well, I understand -- my understanding, based on some of the testimony that we've heard, was that the MOU was for a one-year period, and it was issued sometime last year.

A. Correct.

Q. Yes? Okay. So at some point the agreement will need to be extended for operators to continue disposing at the San Juan regional landfill of their chlorides that are greater than 1000 parts per million?

A. To the extent that -- what testing will be required, that's correct, but not if it can be accepted.

Q. Okay, to the extent the testing may be required, are you saying --

A. What -- what testing and what limits will be expected at those solid waste facilities before disposal.

Q. Okay, but operators will be required to test their wastes prior to disposal, correct?

A. That's correct.

Q. And they will need to meet certain standards based of chloride and benzene and TPH and BTEX, correct?

A. That's correct, yes.

Q. All right, and it's those standards that determine where that operator can dispose of their wastes?

A. Well, maybe if I could back up just a bit. For industrial waste for a municipal solid waste landfill, there are no specific limits set on each particular type of industrial waste within the solid waste management regulations. Therefore, for each particular type of industrial waste some testing limits are set. This MOU has

set those limits, and so through April of next year any waste of this type will have to meet those limits. After April, new limits might be set.

Q. Okay. So then if I hear what you're saying correctly then, is that oilfield wastes that are coming off of the locations that we've been -- that's been the purpose of this hearing, are not considered petroleum-contaminated soils; they are considered industrial waste?

A. That's correct.

Q. And therefore meet different standards than the special waste standards that I showed you earlier?

A. Than the petroleum --

Q. -- -contaminated wastes --

A. -- -contaminated -- that's correct.

MS. FOSTER: BTEX --

Okay, thank you. At this time I have no further questions.

CHAIRMAN FESMIRE: Mr. Jantz?

MR. JANTZ: No questions, Mr. Chairman.

CHAIRMAN FESMIRE: Mr. Huffaker?

MR. HUFFAKER: Nothing, Mr. Chairman.

CHAIRMAN FESMIRE: Dr. Neeper?

DR. NEEPER: No questions.

CHAIRMAN FESMIRE: Commissioner Bailey?

(Shakes head)

CHAIRMAN FESMIRE: Commissioner Olson?

EXAMINATION

BY COMMISSIONER OLSON:

Q. Yeah, I want to get to one issue you were bringing up on the -- I guess the results of Dr. Stephens's results, make sure I understand what you're saying. You're saying that the -- his calculations resulted in an SPLP leachate chloride standard of 1240 for material to be left in place that won't cause an exceedence of the groundwater standards?

A. That's true, yes.

Q. And so it should be that, regardless of whatever mixing, the final result should be -- shouldn't be leaving 1240 milligram per liter of chloride by SPLP in place, however you mix it?

A. Right, it should not exceed 1240.

Q. Because that's the model -- the level he modeled at that point?

A. Yes.

Q. And that level is based upon the 50-foot mixing zone; isn't that correct?

A. That's correct.

Q. So -- and I believe Dr. Stephens had -- said that was a linear relationship based upon that mixing zone, so if I took the mixing zone to be equivalent to a typical

monitor well thickness of 10 feet, that would be similar to what your model represented; wouldn't that be correct?

A. Yes.

Q. And so am I correct that if I took 1240 and took one-fifth of that, I'd get approximately 260 by an SPLP method?

A. That's correct.

Q. And that would be an equivalent comparison and mixing zone to the modeling that you did then; isn't that correct?

A. Yes.

Q. Except he got a much lower number, using a less sophisticated model?

A. Yes.

Q. Okay. And this issue is coming up in reference back to the surface waste management rule, Rule 36, talking about the landfarming levels that are allowed in Rule 36, and we spent a lot of time talking about those levels when that was adopted. But for a small landfarm you'd be allowed to leave on the surface 500 milligram per kilogram of chloride -- that's total chloride, not SPLP, correct?

A. Correct.

Q. So -- But I guess as my understanding, at least under the definition of small landfarms, that excludes small landfarms, right? They're not allowed to have drill

cuttings?

A. I'm not familiar with that particular provision.

Q. Okay. And if I come, well, to the -- I believe Ms. Foster was getting into the requirements, specific requirements, for the -- more of the commercial and centralized landfarms where we have a 500-milligram-per kilogram chloride level where the groundwater is less than 100 feet but more than 50 feet, correct?

A. Right.

Q. And we have a chloride level allowed of 1000 milligram per kilogram if the landfarm is located where groundwater is more than 100 feet; is that correct?

A. That's correct.

Q. So if we allow chloride levels on the surface in those type of areas with those burying depths to groundwater, why couldn't we use those levels as burial levels with the same depth criterias?

A. Well, that -- of course, the surface waste management regulations were based on spreading out contaminated soils over a large area, and here in Rule 17 we're talking about concentrating -- a moist material being placed into a pit, into a trench, the difference being that you're going to have concentrated moist waste that -- and of course as we've heard, moisture being a very significant portion of the driving force for contaminants down to

groundwater, versus a landfarm that will have a chance to dry these wastes.

Q. Well, I guess if we -- I'm going back to, I guess, some of Conoco's testimony talking about they mix at a, you know, approximately 3-to-1 ratio of their -- of soils to muds, just so they can get it workable enough to be able to get on top of it with equipment. Wouldn't that reduce the moisture content significantly?

A. It would reduce it -- significantly, I don't know if I could say significantly.

The proposed rule would allow for merely passing the paint-filter test --

Q. Right.

A. -- which would have a significant amount of moisture left.

Q. Well, I'm just wondering if there's not some type of inconsistency with not allowing the same thing that would allow for similar things for a landfarm. Would there be a certain moisture content that could be applied to be comparable to a landfarm?

A. I would say no, because it's going to be basically sealed off, the trench will be sealed off, and that moisture will remain in that trench, whereas a landfarm, it will be subject to continue to dry, so...

Q. Okay. Well, I'm just kind of wondering why, you

know, you've got certain chloride levels that are set there and why you couldn't have a similar type -- which is a relatively low level, 500 milligram per kilogram -- why we couldn't have a similar level for --

A. Okay --

Q. -- for burial?

A. -- maybe we can, let me put it a different way. We proposed a 100-mile radius to minimize the possibility of deep-burial trenches. Outside that 100 miles would be the exception to the rule if you go -- not literally have to go through exception, but meaning it would be a rare case that you would have a deep trench.

In those cases, a minimum treatment would get you down to at least 100,000 milligrams per kilogram, or 5000 is what we're proposing, and 5000 milligrams per liter SPLP analysis would equate to that 100,000 milligrams per kilogram. In that particular case, we would hope that the cumulative effects from a possible release would be minimized.

And so if -- and then going back the other way, if we were to consider something less than 100 miles, we would hope that also the Commission would consider a lesser chloride concentration for disposal in a deep trench.

Q. Well, the 500-milligram-per-kilogram total chloride is significantly less than 5000-milligram-per-

liter --

A. Yes.

Q. -- of leachate up here in SPLP. And I guess one of my concerns that comes out of that is that -- Well, maybe let me put it this way.

So you -- OCD had used 50 feet to groundwater in their modeling exercises. I guess do you consider that to be -- anything between 50 and 100 also to be shallow to groundwater, as a depth criteria? I mean, anything less than 100 feet to groundwater seems relatively shallow to me.

A. Yes.

Q. Why did the OCD select 50 feet as the criteria?

A. Well, in my original direct testimony, as we discussed, that was a -- turned out to be a 20-to-1 dilution through the vadose zone, which is protective for the WQCC 3103 parameters. The chloride will exceed standard, but with a good liner it'll be about 1000 years.

And like I say, with the 100-mile radius we hope to minimize that possibility, to eliminate the possibility of cumulative effects and -- about 1000 years before that would happen.

Q. Because I guess just the way I'm reading Rule 36 here with the landfarm requirements, under this OCD considered kind of a staggered approach that less than 50

feet was obviously very shallow and of high concern, but they also seem to have a concern over the 50 to 100 foot as also being vulnerable to groundwater contamination and as setting out a different level allowed for chloride than they did over 100 feet to groundwater.

So why wasn't a similar-type approach considered for burial as some type of a staggered criteria, based on depth to groundwater?

A. Well, I think I just have to go back to the minimizing of any possibility of groundwater contamination by using a 100-mile radius so we won't have -- or have very few deep trenches. So it's going to be a rare case to put in that staggered effect for those rare cases, I guess.

Q. Well, I guess would you agree that it would make some sense to have some type of staggered criteria, because there's also a threat of groundwater contamination from a shallow area, which I consider 50 to 100 feet to be relatively shallow groundwater conditions? That's just -- 50 feet is just about the length of this room, maybe just a little bit -- the room's just a little bit short of 50 feet here. So it seems to me to be a relatively shallow distance.

Would you agree that it would be reasonable to have some other type of level between 50 and 100 feet?

A. I can't disagree that it would be reasonable.

Q. And that there's a higher potential for groundwater contamination from contaminants, at 50 to 100 feet, versus those over 100 feet?

A. That's correct.

COMMISSIONER OLSON: I think that's all I have at the moment.

CHAIRMAN FESMIRE: Mr. Brooks, do you have a redirect of this witness?

MR. BROOKS: I take it you have no questions, Mr. Chairman?

CHAIRMAN FESMIRE: You take it right.

REDIRECT EXAMINATION

BY MR. BROOKS:

Q. Very good. Yes, there's one thing I wish to ask about, because I want to follow up on what Commissioner Olson was asking you about the difference between the landfarm standard and the -- and the standard for buried pit waste, what we would recommend.

And if I understood correctly -- maybe I misunderstood, but if I understood correctly, Commissioner Olson was saying -- was asking why we would permit the accumulation of chlorides up to the 1000 level in landfarms, and we would generally prohibit deep-trench burials that had -- where don't -- we don't have a standard that would permit deep-trench burials, except subject to

the 100-mile-radius requirement.

Did you understand that to be his question?

A. Well, of course there would be some limits on chloride with the deep-trench burial, but yes.

Q. Yeah. But generally speaking, our rule does not allow deep-trench burial except outside the 100-mile radius, right?

A. That's correct.

Q. But on the other hand, you can at least apply for a landfarm anywhere in the state and put up to 500 milligrams per kilogram of -- anywhere in the state that's at least 50 foot to groundwater, and put up to 100 -- 500 milligrams per kilogram of waste in, correct?

A. That's correct.

Q. Chloride?

A. Correct.

Q. Now, one of the differences that you mentioned was the fact that the exposed waste would dry, correct?

A. Correct.

Q. And that's the landfarm waste?

A. Yes.

Q. Is it not also true that the waste in a deep-trench encasement would be considerably more concentrated than the waste in the landfarm?

A. Correct.

Q. So Mr. von Gonten did some calculations, and you may need a calculator to review this, but he reduced it to cubic yards per acre, and -- You know, I'm going to call Mr. von Gonten, so I think rather than asking this witness to re-do Mr. von Gonten's calculations I'll just ask Mr. von Gonten about that.

CHAIRMAN FESMIRE: Okay. Are there any questions from any of the attorneys pursuant to the issues raised in the redirect examination?

MS. FOSTER: Mr. Chairman, at the risk -- I noticed that you're looking very tired, but at the risk of you getting mad at me, I do have a couple questions, I'm sorry.

CHAIRMAN FESMIRE: On that subject?

MS. FOSTER: On that subject.

CHAIRMAN FESMIRE: Okay, why don't you proceed?

MS. FOSTER: Thank you.

RECROSS-EXAMINATION

BY MS. FOSTER:

Q. Mr. Hansen, you stated that the reason that some -- that there's a differentiation between landfarms and the trench burial was because of the concentration or the moistness of the waste. There's a difference, in your mind?

A. Yes.

Q. Okay. And have you been present for the testimony about the closed-loop systems that have occurred?

A. Yes.

Q. Okay. And isn't that true, that with the closed-loop system there's been a discussion that the volume of a closed-loop system -- of waste that comes out of a closed-loop system is substantially reduced because the moisture content is reduced due to the processes used in the closed-loop system?

A. Yes.

Q. Yes? And the drill cuttings that come out, or the waste that comes out of a closed-loop system, that could be put on a drying pad, correct?

A. Correct.

Q. All right. And do you know what the moisture content would be of an item on a drying pad?

A. I wouldn't.

Q. Okay. Well, let me ask you this. Do you know how wet product can be that is taken to a landfarm, for example? Doesn't that need to pass the paint-filter test?

A. Yes.

Q. Okay. And the cuttings that are put on a drying pad, those are left there to volatilize, et cetera, until the operator decides to take them off the location or bury them, correct?

A. I'm not -- I believe there's a time limit. But yes.

Q. Okay. Now do you know what the time limits are for the small landfarms under Rule 36, how long these cuttings can be sitting on the surface of the soil?

A. I do not.

Q. Okay. Well, does three years refresh your recollection at all?

A. I'm sorry, it doesn't.

Q. It does not, okay.

Well, I mean would you not agree that the landfarm -- the reason that there is a landfarm process is in order to allow the drill cuttings to biodegrade and the hydrogen-contaminated [*sic*] soils to biodegrade and volatilize, correct?

A. Correct.

Q. And that is a -- that would take a longer period of time than just the time period that your drill cuttings would sit on a drying pad?

A. Correct.

Q. All right. Now, based on the conversation that we had before, you can put 1000 milligrams per kilogram -- well, just under -- up to 1000 milligrams per kilogram chloride level in a landfarm, drill cuttings?

A. Given certain site conditions, yes.

Q. Yes. And do you know if landfarms have liners?
A. I believe they do not.
Q. They do not. Okay. And do these landfarms have the 100-mile-radius rule that the pit rule has?
A. No.
Q. So you could -- and do you know how long these -- how large the permitted landfarms could be?
A. No.
Q. Up to 10 acres? Does that refresh your recollection?
A. No.
Q. Okay. You don't know, you don't recall? Okay. But it's larger than your traditional drilling pad or your reserve pit, correct --
A. Correct.
Q. -- for a landfarm?
MS. FOSTER: Okay. Thank you, I have no further questions?
CHAIRMAN FESMIRE: Are there any other questions on the subjects --
MR. BROOKS: I have just one?
CHAIRMAN FESMIRE: Do you get a chance?
MR. BROOKS: It's based on Ms. -- Ms. --
MS. FOSTER: -- Foster.
MR. BROOKS: -- Foster's recross. So I would let

you rule on whether I do. If not, I will ask the question of Mr. von Gonten, who I think also will know the answer.

CHAIRMAN FESMIRE: Okay, I don't want to start a precedent of going into re-redirect examination.

MR. BROOKS: Okay, that's fine. Thank you, sir.

CHAIRMAN FESMIRE: Are there any other questions of this witness?

MR. JANTZ: No, Mr. Chairman.

MR. HUFFAKER: Nothing, Mr. Chairman.

CHAIRMAN FESMIRE: Mr. Hansen, thank you very much.

Mr. Brooks, who's your next witness?

MR. BROOKS: Glenn von Gonten.

CHAIRMAN FESMIRE: Mr. von Gonten, would you step forward, and remembering that you've been previously sworn in this case?

MR. VON GONTEN: I do remember that, Mr. Chairman.

GLENN VON GONTEN,

the witness herein, having been previously duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BROOKS:

Q. Okay, good afternoon, Mr. von Gonten.

A. Mr. Brooks.

Q. I'm hopeful that we're getting close to the end.

A. Me too.

Q. Mr. von Gonten, do you have some experience working with abatement plans and remediation -- abatement of groundwater pollution?

A. Yes, I do.

Q. Dr. Thomas, as I understand it, indicated that it would be just as easy, and maybe easier, to identify the source of and remediate groundwater pollution which was coming from a substantial number of diverse -- or dispersed sources, versus one concentrated source. Do you agree with that proposition?

A. I remember his discussion, and I disagree strongly.

Q. Okay, would you state why?

A. Well, in dealing with an abatement plan for groundwater -- for abatement of groundwater pollution, there are certain things that you have to do. You have to do a site-specific work plan, and this has to go through public participation.

It's my opinion that if you were to deal with an abatement plan attached to a discharge plan for a permitted, centralized facility, such as an OCD-permitted landfill, that it would be much easier to handle administratively.

Numerically, if you look down the road and say some decades in the future when perhaps groundwater contamination hypothetically might be happening as a result of numerous releases from numerous buried drilling pits, then each one is going to have to be dealt with on an individual basis.

We're getting to the point where we're seeing in the northwest -- I believe there was testimony that infill drilling is going from 160-acre spacing to 80-acre spacing, and it can compound that by having multiple units in the same section. So you may have multiple drilling pits or workover pits in a single section.

If you're looking further down in time, many years from now or even in the foreseeable future of a few years, in the immediate future, you may have a number of potential sources that you would have to deal with.

Right now we have no regulation that requires any sort of monitoring of a closed drilling pit, and we're not proposing that. So the only time you would know about a groundwater contamination would be when the surface owner would file a complaint with OCD saying that their water well had been contaminated, either with OCD or perhaps with the Environment Department, or with the State Engineer's office.

So at that point you would presume that the

contamination, hypothetically, would have traveled some distance to the nearest water-well receptor. At that point you would have to backtrack, and you would have to not only know what the groundwater path is today from the water table, but what it had been over the preceding years, since the pit had been installed or closed.

Q. Now you are somewhat familiar, are you not, with the literature on what constitutes prudent waste management?

A. I think I am.

Q. And does the literature on what constitutes prudent waste management suggest that it's better to have a given mass of contaminants dispersed into numerous sources in close proximity or centralized in one repository?

A. I would say that a centralized repository is proper waste management and that a number of dispersed locations might be considered by EPA and Congress to be open dumps, depending on the site-specific nature.

Q. Thank you. There was some testimony, I believe this morning, to the effect that the Oil Conservation Division had not provided a sampling analysis plan for its pit sampling. Do you recall that?

A. I remember hearing that several times.

Q. Is that true?

A. No, I refreshed my memory by looking through our

e-mails. OCD by e-mail from Mr. Ed Hansen to the task force members on May 9th provided a copy of OCD's sampling and analysis plan, after close of business, May 9th, 2007.

Q. To whom?

A. To all members of task force.

Q. Thank you.

A. And there may have been additional people on the cc list.

Q. Thank you. Now I wanted to ask you because you did some calculations for me, when we're talking about pit waste -- Mr. Hansen raised this issue of pit -- buried pit waste, versus waste left in a landfarm.

Now is it accurate to say that -- Well, is the concentration of waste greater in a deep-trench burial than it would be in a landfarm?

A. I believe it certainly could be most of the time.

Q. Okay. Now I want to show you to refresh your recollection -- I'm not tendering this into evidence, but the red marks on there are your calculations, are they not?

A. Right, this is taken from part 36, which in the specific requirements for landfarms says that operators shall apply -- or land, apply their waste in 8-inch lifts within a certain period of time of receipt, and that -- also it says, 8-inch lifts, or approximately 1000 yards per acre --

Q. Okay.

A. -- and so there would be a maximum of three lifts, and then --

Q. Now that's cubic yards, right?

A. Cubic yards per acre, is in the part 36. So three lifts, that would be 3000 cubic yards, would be the land application rate for a landfarm, as opposed to a deep trench which may have perhaps -- you know, the numbers depend on the size of the well, but could have somewhere between 5000 to 10,000 cubic yards buried in a relatively small deep trench.

Q. Which would mean how many cubic yards per acre?

A. Well, if you extrapolated that -- you would have to look at what the average deep trench would be, but I think it would be multiples of that. So there would be a greater land application rate -- ratio on a per-acre basis for a deep trench than there would be for an OCD-permitted landfarm.

Q. And is that a relevant consideration in determining what risk that these emplacements would present for groundwater?

A. I believe it is. I think that the risk has been talked about a great deal, but certainly mass of the chlorides is one of the things that we have always considered in our calculations.

Q. Now you remember part 36 quite well, I think?
A. I do.
Q. And does part 36 require testing underneath a landfarm to determine if there's been a release?
A. Yes, it does.
Q. And does it require monitoring?
A. It does require monitoring.
MR. BROOKS: Thank you, I believe that's all my questions.
CHAIRMAN FESMIRE: Mr. Hiser?
MR. HISER: I don't think I have any questions.
CHAIRMAN FESMIRE: Mr. Carr?
MR. CARR: No, sir.
CHAIRMAN FESMIRE: Ms. Foster?
MS. FOSTER: I do.

CROSS-EXAMINATION

BY MS. FOSTER:
Q. Mr. van Gonten, concerning this -- the landfills, versus the oil and gas locations, the multiple oil and gas locations, I want to talk to you about that.
In terms of liability issues, if there is a release from a landfill while a landfill is in operation, who accepts liability for that release for cleanup?
A. The landfill operator.
Q. Okay. And what happens after the landfill is

closed? Who pays for the cleanup after the landfill is closed?

A. I would have to check the regulations on what post-closure requirements are.

Q. Okay. Well release of liability occurs 30 years after closure. Are you aware of that?

A. I would believe that's consistent with what I assumed it would be.

Q. Okay. And were you here -- were you present for Mr. Hansen's modeling?

A. Not for all of it.

Q. Okay. Well, Mr. Hansen's modeling seemed to indicate that if there is a release from a pit or a location that has -- that the length of time to reach groundwater would be somewhere around the area of 80-plus years; are you familiar with that testimony?

A. What I remember is that for a deep-trench burial on site with 50 feet separation of water, it could take on the order of 75 years.

Q. Okay. So a landfill that is closed, their liability is released after 30 years. Who picks up the tab for cleanup of a landfill after liability has been released?

A. I would have to research that. I really don't know.

Q. Okay, would it not be the state -- the taxpayers of the State of New Mexico?

A. It could be.

Q. Okay. Now are you familiar with the oil and gas rules under the Oil and Gas Act?

A. Certain parts that deal with the environmental aspects, yes.

Q. Okay. And if there's a release in an oil and gas site, who is responsible for cleanup of that?

A. The operator.

Q. The operator. And is that during operations that the operator would be responsible and therefore liable?

A. I would have to go back and check that out. Let's say that there was a site which the -- there was a lease on which a well was drilled and it was plugged and abandoned, it was dry, it was not profitable and they walked away from it, and a contamination was discovered 10 years later, but they were no longer the operator. I think we have the authority to go after the previous operator.

Q. Okay, but you would have the authority to go after an oil and gas operator?

A. Yes.

Q. Now are you familiar with the reclamation fund that is managed by the OCD?

A. Somewhat.

Q. Okay. And what's the purpose of the reclamation fund?

A. It has several purposes. One of the main stated ones is to go back and look at improperly plugged and abandoned wells and deal with those where operators are no longer available to cover their proper responsibilities.

Q. In other words, if you can't find the operator to do a remediation if necessary?

A. It would include that, yes.

Q. Okay, and do you know where the funding for the reclamation fund comes from?

A. The exact nature of that -- I can tell you in general that it is something that the operators pay.

Q. Operators pay, so it's not the taxpayers of the State of New Mexico?

A. That's right.

Q. Now I wanted to ask you about your deep-trench waste volume numbers. You stated that it could be anywhere from 5000 to 10,000 cubic yards?

A. Well, I base that on a quick recollection of what I've heard over the past few days this week about the volumes that would be drilled -- or excuse me, the volumes of waste that would be generated in a pit. The discussion was versus -- a conventional lined earthen pit, versus the amount of waste generated in a closed-loop system. So

there were a number of estimates.

Q. Okay. And did the waste volumes that you're talking about here, did this come off of Sam Small's testimony or one of the OCD witnesses?

A. You know, I would say that it's a combination of the testimony, they're all kind of running in my head right now. But I think that $5000 to $10,000 is something that -- for the purposes of what I was trying -- the point I was trying to make, I think that's a reasonable number. I'm sure there's examples of more pit volume wastes that would have to be disposed of, and less --

Q. Depending on --

A. -- the site-specific --

Q. -- depth of the well --

A. -- exactly.

Q. -- site-specific, et cetera, et cetera?

Well, were you here for Mr. Carl Chavez's testimony?

A. I was.

Q. Did he not testify that 1000 cubic yards is the amount that he used for his calculations?

A. I don't remember that detail, to be honest.

Q. You don't remember that detail. Okay.

And then your discussion over -- that pit waste in a pit location or deep-trench burial or on-site closure

is different than that on the landfarm.

A. I'm sorry, I didn't understand the question.

Q. Okay, I'm just trying to point you to where we're going --

A. Okay.

Q. -- in a previous discussion. You had the discussion of the pit waste versus the landfarm, and you mentioned that there was an 8-inch lift requirement in landfarms; remember that discussion?

A. That's the part 36 language, yes.

Q. Okay. And there are certainly different types of landfarms, correct?

A. Well, they're all for the remediation of petroleum-contaminated soils and cuttings.

Q. Yes. Well, the purpose is the same, but in terms of -- there's different types of permitting, and there's different sizes, depending on the type of permit that you get, correct?

A. I wasn't aware that there was a size limitation. Now there is one if you're talking about -- there's permitted landfarms, and then there's what was referred to, small landfarms which are unpermitted. There's a difference there.

Q. Right. Okay --

A. But the others are commercial or centralized

landfarms, and they have the same standards.

Q. Do you recall how large a centralized landfarm could actually be?

A. The individual cells, I don't remember. The facility itself could be as large as 500 acres.

Q. 500 acres, okay. And 500 acres with the 8-inch lift all the way across would be a lot more waste than what you'd find in that -- in a deep-trench burial pit on a location, correct?

A. That's true.

MS. FOSTER: I have no further questions.

CHAIRMAN FESMIRE: Mr. Jantz?

MR. JANTZ: No questions, Mr. Chairman.

CHAIRMAN FESMIRE: Mr. Huffaker?

MR. HUFFAKER: Nothing, Mr. Chairman.

CHAIRMAN FESMIRE: Doctor?

DR. NEEPER: No questions.

CHAIRMAN FESMIRE: Commissioner Olson?

EXAMINATION

BY COMMISSIONER OLSON:

Q. I guess the main thing that comes in with the -- versus -- thinking about all of this discussion with the landfarms, is just moisture content then. Is that the main issue in the...

A. I think that that's one of the important

considerations. If we're comparing and contrasting stabilized waste that would be disposed of on-site in a deep-trench -- in a burial scenario, versus a relatively thin but widely spread landfarm scenario, I think the geometry and the concentrations are two of the more important things.

I think the moisture content would change very slowly in a deep-trench burial, but it might get very wet, and there's provisions for actually, you know, pulling off any sort of standing water in a landfarm, if I remember correctly, in a fairly short period of time, 24 or 48 hours. And after that, then the landfarm is going to dry out. Of course, it needs moisture for the bioremediation to actually move forward.

So I think it's a lot more dynamic situation than a landfarm, as far as the drying and wetting, and that it is not stabilized waste as we would require in a deep-trench burial.

Q. But if we did look at a requirement for stabilized waste, that would change your opinion, then?

A. I don't know where you're going with that, in what I --

Q. Well, I'm thinking in term of the pit contents being stabilized through -- and the moisture or contaminant concentrations being a certain level.

A. Well, the concentrations that we're going to be determining are by -- after testing by SPLP, you would -- We've been discussing, I think here today, mostly the assumption that you would blend for -- to stabilization, one or more volumes of soil, clean soil, to that.

You might also use cement kiln dust and, you know, cement. You might actually go to solidification instead of just stabilization, which would also be a form of stabilization.

So I think the rule has a little bigger aspect on it, that -- that maybe has been discussed, as far as the volumes and the concentrations.

I think your concentrations *in situ*, you know, would depend on how you actually stabilize or solidify the pit contents.

My point is that you could have a very high concentration, but it's not leachable by the -- you know, not detectible by the SPLP, just to make that one point.

I think that if you've got really stabilized or solidified waste, then -- you know, then that's proper waste management, ignoring the issue of whether it should be centralized or *in situ* disposal. That's kind of pre-treatment before disposal.

Q. Uh-huh. But I guess, then, your main concern comes down to the -- with -- especially with 80-acre

spacing, then, in the San Juan Basin, you'd be looking at, you know, a series of them per section --

A. I think that's --

Q. -- that's the concern over --

A. Yeah, the combined or cumulative effects -- the risk of having combined or cumulative effects goes up. And as we pointed out, there's not only going to be the original drilling pit, but there can be perhaps several workover pits. Let's say that we, you know, do away with produced-water pits. But that's also the weight-loading to the environment.

COMMISSIONER OLSON: Okay, that's all I had.

CHAIRMAN FESMIRE: Mr. Brooks any redirect?

MR. BROOKS: Just one question. I can't resist one question.

REDIRECT EXAMINATION

BY MR. BROOKS:

Q. Mr. von Gonten, are there some reasons why -- are there some reasons that don't have to do with chlorides by its prudent waste management to allow oil and gas -- oilfield wastes in certain circumstances to be put in a landfarm?

A. Well, I'm not sure I understand your question, but if you take oilfield waste and your primary contaminant is hydrocarbon, then that's better to treat it and be able

to reuse or recycle those cuttings in a commercial -- in -- recovered from a centralized landfarm, potentially, than to dispose of them long-term in a landfill.

Q. Exactly. And wouldn't it have been prudent, then, for the Commission -- or would it have been prudent, then, for the Commission to make a tradeoff there and allow a certain amount, some minimal amount of chlorides to be landfarmed in order to get that treatment advantage?

A. We thought that there was a level -- you know, ideally you would like to say that it's 100 percent, but the materials that are generated in pit contents generally will have some buildup of chlorides, as they will of other constituents as well.

MR. BROOKS: Thank you, that's all I have.

CHAIRMAN FESMIRE: Is there any other questions of this witness?

Commissioner Olson?

(Laughter)

CHAIRMAN FESMIRE: You know, that was -- that was brave --

(Laughter)

CHAIRMAN FESMIRE: -- if not somewhat timid.

EXAMINATION

BY COMMISSIONER OLSON:

Q. I was just wondering. So, but it -- but wouldn't

-- if you had cuttings -- I think just the drying pads on a closed-loop system, if you just got cuttings that are already dried, if they're meeting the chloride levels, wouldn't that be analogous to what you'd be -- wouldn't that be able to go to a landfarm, then? I mean, it's --

A. The --

Q. -- they're actually cuttings versus mud.

A. Yes, you can certainly take cuttings to a landfarm, and I don't think there's a restriction that says the landfarms can only take a particular type of oilfield waste. I think you can take spill or remediation waste, and that's appropriate for treatment in a landfarm. The purpose of a landfarm is treatment, so if you've got hydrocarbons that you need to treat before disposal, then a landfarm is a place to do that.

COMMISSIONER OLSON: Okay.

CHAIRMAN FESMIRE: Any other questions of this witness?

MR. BROOKS: Nothing further.

CHAIRMAN FESMIRE: Mr. Brooks, do you have any more case?

MR. BROOKS: Mr. Chairman, subject to something coming up in Dr. Stephens' testimony, which we might conceivably, although I think unlikely, ask for further rebuttal, the Division closes.

CHAIRMAN FESMIRE: Mr. Carr, Monday your only witness is Dr. Stephens?

MR. CARR: Yes, sir, that's right.

CHAIRMAN FESMIRE: Then we're going to have closing statements?

MR. CARR: Correct.

COMMISSIONER OLSON: Dr. Neeper --

CHAIRMAN FESMIRE: Oh, Dr. Neeper --

DR. NEEPER: Yes?

CHAIRMAN FESMIRE: -- you will have a closing statement Monday also?

DR. NEEPER: We understand that closing statements can be submitted in writing?

CHAIRMAN FESMIRE: Yes, sir.

DR. NEEPER: We will be here, but I think we will submit ours in writing.

CHAIRMAN FESMIRE: Okay.

MR. BROOKS: I'm sorry, does Dr. -- did -- I was wondering if Dr. Neeper had any rebuttal that --

CHAIRMAN FESMIRE: Doctor, did you have any rebuttal that you wanted to offer today?

DR. NEEPER: Yes, we have one five-minute rebuttal to offer.

CHAIRMAN FESMIRE: Is your witness here today?

DR. NEEPER: Yes, I am here today.

(Laughter)

CHAIRMAN FESMIRE: Okay. Ms. Foster?

MS. FOSTER: Yes, Mr. Chairman, I just wanted to get a clarification.

If Dr. Neeper's closing statement is going to be submitted in writing, when would we be able to receive that and therefore be able to talk about anything that he will talk about in his closing?

CHAIRMAN FESMIRE: That's a good point. We'll talk about that after his rebuttal testimony, okay?

MS. FOSTER: Thank you.

CHAIRMAN FESMIRE: Dr. Neeper, why don't you please take the stand?

MR. VON GONTEN: Am I excused, Mr. Chairman?

CHAIRMAN FESMIRE: You are, sir.

Doctor, you remember that you're still sworn in this case, don't you?

DR. NEEPER: Yes, Mr. Chairman, I remember that I am still under oath.

I will -- Is there someone who can operate the projector?

I will offer one graph for submission as a possible exhibit. All parties, so far as I know, to this hearing have been serviced with a copy as of this morning, but I think these persons should have the opportunity to

object --

CHAIRMAN FESMIRE: Okay.

DR. NEEPER: -- before we go farther, if they should choose to.

CHAIRMAN FESMIRE: Okay, sir.

MR. HISER: He probably should identify --

DR. NEEPER: All right --

MR. HISER: -- what exhibit he's talking about for the record.

DR. NEEPER: -- I will identify it, then.

In cross-examination I attempted to ask Mr. Byrom to compare his estimated impact of the rule on drilling activity with the context, that is, what is the background or the natural or the occurring variation in drilling activity?

Mr. Byrom chose in effect not to make that comparison, but in effect declined to answer it.

I wished to then supply a graph of the -- simply the rig count for the last two years, as it is available on the public website of New Mexico Tech. This is the same -- part of the same data as might have been included in IPANM's Exhibit 23, had they chosen to submit it. And I was hoping that Mr. Byrom would refer to that and use that in his testimony.

So to rebut his lack of background, I would like

to offer that background, which is publicly available information.

With that, I think the parties should have -- is it correct? -- opportunity to object before the Commission sees this material?

CHAIRMAN FESMIRE: Why don't you lay the foundation, tell us what it is, where it comes from, and --

DR. NEEPER: The material is a graph of the rig count in New Mexico and Colorado from 2004 through day 300 of 2007, taken from the Petroleum Recovery Research Center, Socorro, New Mexico, website, for which the address is given at New Mexico Tech on the exhibit itself.

CHAIRMAN FESMIRE: Okay, why don't we mark that Citizens for Clean Air and Water Rebuttal Exhibit 1?

DR. NEEPER: It is marked as Rebuttal Exhibit 5, Mr. Chairman.

CHAIRMAN FESMIRE: Okay, Exhibit 1 has already been admitted, I guess?

DR. NEEPER: Because we have -- this would be our fifth exhibit, and it is a rebuttal exhibit, so simply maintaining numerical order, I labeled it Rebuttal, but Exhibit 5.

CHAIRMAN FESMIRE: Okay --

DR. NEEPER: Consists of one page.

CHAIRMAN FESMIRE: -- is there any objection to

the admission of Rebuttal Exhibit 5 from New Mexico Citizens for Clean Air and Water?

MR. HISER: No objection.

MS. FOSTER: No objection.

MR. BROOKS: No objection.

MR. JANTZ: No objection.

CHAIRMAN FESMIRE: Okay.

DR. NEEPER: May I approach the Commission to offer printed copies?

CHAIRMAN FESMIRE: You may, sir.

DR. NEEPER: There are six copies for the Commission.

CHAIRMAN FESMIRE: Thank you, sir.

DONALD A. NEEPER, PhD,

the witness herein, having been previously duly sworn upon his oath, testified as follows:

DIRECT TESTIMONY

BY DR. NEEPER:

DR. NEEPER: My total testimony in regard to this exhibit is that when I look at the blue line I notice the variation within a given year, any given year, is something like or perhaps greater than about 10 percent, and I notice that the total variation over about a three-or-more-year period there is 40 percent or more of the total activity.

That is the sum of my observations on this. I

have no further interpretations to offer. I simply felt this information belonged in the record of the hearing.

CHAIRMAN FESMIRE: Okay, are there any questions of this witness?

MR. HISER: No questions.

MS. FOSTER: I have a few questions, Mr. Chairman.

CHAIRMAN FESMIRE: Okay.

MS. FOSTER: I'm kind of surprised you didn't say, Of course you do, Ms. Foster. At least that's what your look told me. Just a few.

CROSS-EXAMINATION

BY MS. FOSTER:

Q. Dr. Neeper, could you give us a reason why the blue line on your graph, the cumulative blue line as it goes across from year 2004 to year 2007, would increase up to the first half of the year 2006? The Colorado numbers seem to increase as well.

A. I cannot give you any reason for why the industry has the variation it has.

Q. Okay, would that --

A. That's not within my expertise.

Q. Okay, could that not be because of an increase in oil and gas prices?

A. I would not offer an interpretation of this.

Q. Okay.

A. I have not researched that issue.

Q. Okay. Now just so the record is clear, in year 2007, there is definitely a divergence in the red line, which represents your Colorado rig count, and the blue line which represents the New Mexico rig count, correct?

A. That is correct.

Q. Okay. And could you guesstimate how much the drop between day 240 and 300 of year 2007 occurred on the New Mexico count?

A. I will let you interpret that, if you will. I've heard discussion of the relative Colorado increase and the relative New Mexico decrease given by an expert economic witness sponsored or offered by OGAP, and I have no other opinions or interpretations to add to that.

Q. Okay. Well, based on the blue line, that it has -- on your exhibit from year 2004 through 2007, has there ever been a marked -- such a large percentage drop, based on the blue line that you have?

You have to understand that the -- what -- I'm trying to describe this piece of paper for the record, since the record is not visual.

A. Yes, you are asking me if the rather precipitous-looking drop after day 240 in 2007 is typified by any other changes that one might see in the blue line on the graph,

if I am correct --

Q. Yes.

A. -- if I understand your question.

Q. Yes.

A. I see a change after approximately day 60 of year 2005 of about the same size, even though that one is an increase, and the one shown in 2007 is a decrease. Beyond that, unless I did a statistical analysis of these data as a -- part of a complex system, and looked -- if I may use technical language -- at the 1/F noise in the system, I would not be able to interpret it further.

Q. Okay. But basically on your testimony, there is a divergence between the Colorado and New Mexico numbers for the year 2007 only, based on your -- on this exhibit?

A. The chart shows the lines diverging, and the expert witness for OGAP, I believe, made some interpretation of that.

Q. Okay. Now these changes in the rig count -- well, let me ask you this. The proposed Rule 17 has actually not been implemented as of yet, correct? By operators?

A. I am sorry, I am not an expert on Rule 17.

Q. Okay, well, Rule 17 --

A. This -- You're referring --

Q. Yes --

A. -- to the current rule --

Q. Yes, I'm sorry, the proposed --

A. -- 19.15.17.

Q. Yes, sir.

A. Yes.

Q. The rule that we are here discussing for the last --

A. This rule has not yet been adopted, to the level of my understanding.

Q. That's right. Okay. So the operators have not had to absorb any cost changes in any -- as of yet, as of today, November -- December 7th, 2007?

A. Well, the operators have had to absorb the cost of participating in these proceedings as of --

(Laughter)

Q. Okay. So with the -- once this rule gets implemented, would not the cost increase, if anything, on the operators be reflected on the rig count?

A. I cannot testify as to the intentions or motivations of the operators for the rig counts that we show on the graph, and I do not estimate what's going to happen beyond the time shown on this graph.

Q. Okay, so then -- just so I understand your testimony, then, basically your testimony is that for 2007 there is a decrease in the rig count in New Mexico?

A. My testimony is that this information on the graph was taken from the source. I trust the source. It is also the source cited in your Exhibit 23, and I feel that this information, since rig count has been discussed in this hearing, should be in the record of the hearing.

MS. FOSTER: Okay, thank you. I have no further questions. Thank you, Dr. Neeper.

CHAIRMAN FESMIRE: Mr. Jantz?

MR. JANTZ: No questions.

CHAIRMAN FESMIRE: Mr. Huffaker?

MR. HUFFAKER: Nothing, Mr. Chairman.

CHAIRMAN FESMIRE: Commissioner Bailey?

COMMISSIONER BAILEY: No.

CHAIRMAN FESMIRE: Commissioner Olson?

COMMISSIONER OLSON: No.

CHAIRMAN FESMIRE: Okay. Any other questions of this witness? Okay.

Dr. Neeper, thank you very much.

DR. NEEPER: Thank you.

CHAIRMAN FESMIRE: With that, why don't we go ahead and adjourn --

MR. HISER: Public comments?

CHAIRMAN FESMIRE: Oh, yeah, comments.

(Laughter)

CHAIRMAN FESMIRE: Is there anybody in the

audience that would like to make a comment?

Seeing none, we will go ahead and adjourn, to reconvene back here Monday morning at nine o'clock.

Mr. Carr, Dr. Stephens is your only witness at that time?

MR. CARR: Yes, sir, that's correct.

CHAIRMAN FESMIRE: Okay, and there are no further witnesses after Dr. Stephens at this time?

MR. BROOKS: (Nods)

CHAIRMAN FESMIRE: Okay. Can I talk to the attorneys about a scheduling matter after we adjourn?

And with that, we'll adjourn.

(Thereupon, evening recess was taken at 4:03 p.m.)

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CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Commission was reported by me; that I transcribed my notes; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL February 15th, 2008.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 16th, 2010