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 XV - December 4th, 2007

Santa Fe, New Mexico

This matter came on for hearing before the Oil Conservation Commission, MARK E. FESMIRE, Chairman, on Tuesday, December 4th, 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...)

Thursday, November 8th, 2007 (Volume V)
Commission Hearing
CASE NO. 14,015



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Friday, November 9th, 2007 (Volume VI)
Commission Hearing
CASE NO. 14,015



(Continued...)

(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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(Continued...)

Wednesday, November 14th, 2007 (Volume VIII)
Commission Hearing
CASE NO. 14,015



(Continued...)

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(Continued...)

Thursday, November 15th, 2007 (Volume IX)
Commission Hearing
CASE NO. 14,015



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(Continued...)

Friday, November 16th, 2007 (Volume X)
Commission Hearing
CASE NO. 14,015



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(Continued...)

Monday, November 26th, 2007 (Volume XI)
Commission Hearing
CASE NO. 14,015



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(Continued...)

Tuesday, November 27th, 2007 (Volume XII)
Commission Hearing
CASE NO. 14,015



(Continued...)

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Friday, November 30th, 2007 (Volume XIII)
Commission Hearing
CASE NO. 14,015



(Continued...)

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Monday, December 3rd, 2007 (Volume XIV)
Commission Hearing
CASE NO. 14,015



(Continued...)

PUBLIC COMMENTS:



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Tuesday, December 4th, 2007 (Volume XV)
Commission Hearing
CASE NO. 14,015



IPANM WITNESSES (Resumed):



INDUSTRY WITNESSES (Resumed):



(Continued...)

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| Industry | Identified | Admitted |
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| NMCCAW | Identified | Admitted |
|---|---|---|
| Exhibit 1 | 1757 | 1861 |
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| IPANM | Identified | Admitted |
|---|---|---|
| Exhibit 1 | - | - |
| Exhibit 2 | - | - |
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| Exhibit 4 | 3074 | 3176 |
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(Continued...)

E X H I B I T S (Continued)

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Additional submissions by the Division, not offered or admitted:

| | Identified |
|---|---|
| OCD's Requested Changes to 9/21/07 proposal, 11/7/07 | 558 |
| e-mail from David Brooks to Kelly O'Donnell, 10/22/07 | 559 |

* * *

A P P E A R A N C E S

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FOR NEW MEXICO OIL AND GAS ASSOCIATION; CONOCOPHILLIPS COMPANY; DUGAN PRODUCTION CORPORATION; and ENERGEN RESOURCES CORPORATION; and an INDUSTRY COMMITTEE comprised of BP America Production Company, Inc.; Benson-Montin-Greer Drilling Corporation; Boling Enterprises, Ltd.; Burlington Resources Oil and Gas Company; Chesapeake Energy Corporation; Chevron USA, Inc.; ConocoPhillips Company; Devon Production Company; Dugan Production Corporation; Energen Resources Corporation; Marathon Oil Company; Marbob Energy Corporation; Merrion Oil & Gas Corporation; Occidental Permian, which includes OXY USA, Inc., and OXY USA WTP Limited Partnership; Samson Resources Company; J.D. Simmons, Inc.; Williams Production Company, LLC; XTO Energy, Inc.; and Yates Petroleum Corporation:

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(Continued...)

A P P E A R A N C E S (Continued)

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BY: ERIC JANTZ
and
BRUCE BAIZEL

* * *

ALSO PRESENT:

JOHN BARTLIT, PhD
DONALD A. NEEPER, Phd
New Mexico Citizens for Clean Air and Water

* * *

WHEREUPON, the following proceedings were had at 9:02 a.m.:

CHAIRMAN FESMIRE: At this time we will reconvene Case Number 14,015.

Let the record reflect that it is 9:00 a.m. on Tuesday, December 4th, 2007.

Let the record also reflect that all three Commissioners, Commissioner Fesmire, Bailey and Olson are all present, therefore a quorum of the Commission is present.

I believe through an agreement yesterday we had decided that we would complete the examination of Mr. Byrom, starting with his redirect examination by Ms. Foster; is that correct?

MS. FOSTER: Yes, sir, that's correct.

CHAIRMAN FESMIRE: Mr. Byrom, would you please take the stand, please?

MR. BYROM: Yes, sir.

CHAIRMAN FESMIRE: And you understand that you've been previously sworn in this case?

MR. BYROM: Yes, sir.

MS. FOSTER: May I proceed, Mr. Chairman?

CHAIRMAN FESMIRE: You may, ma'am.

MS. FOSTER: Thank you.

JOHN BYROM (Resumed),

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

REDIRECT EXAMINATION

BY MS. FOSTER:

Q. Good morning, Mr. Byrom.

A. Good morning.

Q. Okay, during much of your cross-examination as well as your direct testimony, you showed several graphs concerning marginal production in the San Juan Basin, correct?

A. That's correct.

Q. What percentage of these marginal wells are actually drilled by independent operators?

A. I don't have an exact number, but generally the independents are producing -- or drill more of the marginal wells, just because they have less of the premium acreage to begin with.

Q. Now in response to Mr. Brooks's cross-examination questions, were you present with -- were you present for Mr. Carl Chavez's testimony?

A. Yes, I was.

Q. And concerning his estimates on the additional amount of trucking for closed-loop systems?

A. Yes, I was.

Q. And were you present for Mr. Sam Small's testimony --

A. Yes.

Q. -- concerning the same issue?

A. Yes, I was.

Q. Okay, and do you recall the numbers that were highlighted by Mr. Chavez and the additional number of trucks, closed-loop system?

A. I think Mr. Chavez even mentioned as high as 100 or 80, something in that range.

Q. Okay, and that was for one closed-loop system?

A. That's correct.

Q. Okay.

A. And the dig-and- -- I mean the hauling away also --

Q. Okay.

A. -- of the cuttings.

Q. Now I believe in your testimony you also stated that you believe that there'd be approximately a 30-percent amount of reduction in drill -- in wells?

A. Yes, there's a potential for that.

Q. Okay. And -- but the number of trucks that will

be coming off closed-loop systems, will that offset the amount of -- the reduction in drilling that's going to occur?

A. Yeah, in that scenario if there was a 30-percent reduction in drilling, then I think, looking at the number of trucks, that each well would be having to -- an additional number of truck trips for the dig-and-haul or the closed-loop, either one, would more than offset that by, I would think, a significant margin.

Q. Okay. So then the end result is that there would be more trucks on the road?

A. Yes.

Q. And now are you involved at all in your company with safety issues?

A. Yes, I am.

Q. Okay, and did you hear Mr. Jason Sandel's testimony yesterday?

A. Yes, I did.

Q. Okay, and do you also have those same concerns concerning safety issues?

A. Well, I think anybody is going to have those same concerns with safety issues, definitely, I think, with the -- if you are doing closed-loop, then you've got more complex equipment on the location, so that's one potential area.

You have more personnel on the location, and then having to deal with additional truck traffic, once again, that goes back to highway stats, which I'm not necessarily that familiar with, but certainly that is a concern.

MS. FOSTER: All right, I have no further questions of Mr. Byrom. Thank you, Mr. Chairman.

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

MR. BROOKS: Not from us, Mr. Chairman.

MR. JANTZ: No, Mr. Chairman.

CHAIRMAN FESMIRE: Okay. From the Commissioners?

Mr. Byrom, thank you very much.

MR. BYROM: Okay, thank you.

CHAIRMAN FESMIRE: I believe the next witness, we've decided, is Mr. Eric Pease? Is that correct?

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

CHAIRMAN FESMIRE: Mr. Pease, would you come forward, please?

Mr. Pease, would you raise your right hand and be sworn, please?

(Thereupon the witness was sworn.)

CHAIRMAN FESMIRE: And let the record reflect that this is not Ms. Foster's witness, this is Mr. Hiser's witness.

MR. HISER: Thank you, Mr. Chairman.

R. ERIC PEASE,

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

DIRECT EXAMINATION

BY MR. HISER:

Q. Mr. Pease, could you state your name for the record, please?

A. My name is Eric Pease.

Q. And who are you employed by?

A. I'm employed by Daniel B. Stephens and Associates.

Q. And could you tell us a little bit about your educational and professional background, please?

A. Yes, I have a bachelor of science degree in civil engineering, a master of science degree in civil engineering, a professional engineering license in the State of New Mexico, and I have about eight years' experience in private consulting and then four years' experience with the federal government.

Q. And what was your experience with the federal government?

A. I worked for the Corps of Engineers, Albuquerque District.

Q. Thank you. And so as part of that education and professional background, do you do the compilation of civil

engineering estimates in terms of impacts of various projects?

A. Yes.

MR. HISER: Mr. Chairman, we would tender Mr. Pease as an expert in civil engineering.

CHAIRMAN FESMIRE: Mr. Pease, where did you get your degrees?

THE WITNESS: I received my degrees from the University of New Mexico.

CHAIRMAN FESMIRE: Both your BS and MS?

THE WITNESS: Yes, sir.

CHAIRMAN FESMIRE: Okay. Is there any objection to -- I'm sorry, Mr. Hiser, an expert in exactly which field?

MR. HISER: Civil engineering.

CHAIRMAN FESMIRE: Civil engineering. Is there any objection to Mr. Pease being accepted as a witness -- as an expert in civil engineering?

MR. BROOKS: No, Mr. Chairman, there's not from us.

CHAIRMAN FESMIRE: Let the record reflect that there was no objection. He will be so admitted.

Q. (By Mr. Hiser) Mr. Pease, were you asked to serve as the project manager and compiler of the report for Daniel B. Stephens on the effects of the proposed pit rule?

A. Yes, I was.

Q. Okay. And does Exhibit 10 reflect the results of that work?

A. I assume that this report is Exhibit 10?

Q. Yes, New Mexico industry committee Exhibit Number 10.

And on this it says the Effects of NMOCD Proposed Rule -- it says 53. Is that actually meant to be the proposed pit rule that we're presently discussing?

A. It should be proposed Rule 50.

Q. Okay --

CHAIRMAN FESMIRE: Which is really proposed Rule 17.

Q. (By Mr. Hiser) 17, okay. But this is meant to reflect the rule that's presently under consideration by the Commission, is it not?

A. Yes, it is.

Q. Okay, thank you. Now on page i of the -- there's a table of contents for your report, and in that you have a -- thing, and it talks about four specific items: Landfill Capacity and Drilling/Reserve Pit Material Volumes, Air Pollutants, Highway Pavement and Traffic Accidents. Is that meant to be the scope of the work that you were asked to conduct?

A. Yes, it is.

Q. And so what you did is, you took some materials and you then provided engineering estimates as to the impacts related to those things, which we'll go through in just a minute; is that correct?

A. That is correct.

Q. Okay. If we turn to page number 1 of your report -- and perhaps we'll wait just a moment here, it looks like Commissioner Olson is looking for his copy. I hate to lose a Commissioner along the way.

A. Are you on page 1 of the body --

Q. Page 1 of the report, as opposed to the executive summary.

A. Okay.

MR. HISER: So Arabic numeral 1.

Exhibit 10 is attached to Ben Thomas's report, Commissioner Olson.

COMMISSIONER OLSON: Oh, I see it. Okay.

Q. (By Mr. Hiser) Great. If we turn to page 1, pages 1 through about 3, if you're to evaluate landfill capacity, could you tell us what you did in this part of the report?

A. Yes, the first part of the report just addresses potential capacity of landfills, and the figure of course shows the landfills that we were aware of when the report was constructed, where they're located within the state.

Q. And how did you determine the landfills that potentially could accept pit waste?

A. I determined those, I called the OCD and spoke to a fellow up there and just asked what landfills in the state were permitted to accept this residue.

Q. And so they provided you with these four facilities; is that correct?

A. That is correct.

Q. Okay. And since you prepared this report have you learned that there may be additional facilities that on a temporary basis could accept pit waste?

A. Yes.

Q. And would that have influenced how you wrote this report?

A. It would have influenced some of the calculations in terms of distances traveled, but I don't think that it would have affected the ultimate conclusions of the report.

Q. And at this time is it your understanding that those additional facilities have the ability to accept that material into the future, or only a limited time period?

A. I'm under the understanding that it's a temporary measure.

Q. Okay. And you were -- in writing this report, were you looking at the immediate impacts, or were you looking at sort of mid-term impacts of the proposed rule,

like, say, three to five years out?

A. Long-term, yes.

Q. Okay. What did you conclude about the capacities and the amount or volume of material that would be disposed?

A. Well, the amounts of material, I received that information from the technical committee. And in terms of what the landfills could accept, most of the landfills that spoke with felt like they could indeed accept all the waste that would be brought to them.

Q. So at this time it did not appear that landfill capacity was necessarily an issue with the permitted -- four permitted landfills?

A. No.

Q. Okay. And by the technical committee, do you mean a group of industry committee members that provided you information based on their operations?

A. Yes.

Q. And from that volume information, did that then lead to the next section of your report which is titled, Air Pollutants Resulting from Increased Truck Traffic?

A. Yes.

Q. Okay. And how did you go about developing the air emissions impacts of the proposed rule?

A. We had -- I was just one of about three authors

on this paper, and so I had a couple technical experts employed.

One technical expert, her name was Brenda Ramanathan, and she did the analysis on air pollutants. And she -- based on the miles traveled, she determined what type of pollutants would be released into the air from the truck traffic, using just standard EPA emissions.

Q. Okay. And did not, in fact, Ms. Ramanathan use that based on NMED environmental -- or the Air Quality Bureau's factors and the EPA model for calculating road emissions?

A. That is correct, yes.

Q. And those figures are summarized in Table 3; is that correct?

A. That is correct.

Q. And so to summarize, they show a range of emissions and the top of that table reflects dust emissions. And is my understanding correct that that would be from the dust being picked up by truck traffic?

A. That is correct.

Q. And then below that is projected tailpipe and tire-wear emissions. What do those emissions reflect?

A. Those emissions reflect what are termed mobile sources. So it's coming form the exhaust of the truck, et cetera, and then tires when they wear down emit some

particulates into the air as well.

Q. And the last would be greenhouse gas emissions, and that would be mostly carbon dioxide, and where would those come from?

A. Those come from just the -- resulting from the combustion of the engine.

Q. And is this a standard methodology that's used and well accepted within the civil engineering community?

A. Yes.

Q. The next section of the report then proceeded on to look at the effect on highway pavement. And tell us a little bit about the methodology that you employed in calculating the impact on the pavements and roadways?

A. The work on the highway was done by another technical expert. His name is Gordon McKeen. And what Gordon did is, given the estimated mileage and the estimated haul volumes that we received from the committee, he analyzed three different types of roads that might be affected, due to the hauling of the waste to these landfills.

And based on fully loaded trucks -- I think he assumed a volume of 14 cubic yards -- he calculated a weight for each truck. Now that's typically converted to what's called an equivalent single axle load, and that's what pavement design engineers use to determine the stress

on the pavement.

And so just based on the mileages and the weights of those trucks, he calculated the extra wear that would be felt by the pavements.

Q. And then did he contact the New Mexico Department of Transportation to obtain some road gradings for the various classes of roadways in New Mexico?

A. Yes, he did.

Q. And as a result of gathering that information, what was the conclusion that was reached in terms of potential highway pavement impacts and highway impacts?

A. He concluded that, especially near the landfills, that there would be significant additional stress on these pavements that might require some attention by the State.

Q. And didn't that in fact -- did they conclude that we might exceed in a relatively small number of years the pavement -- or the road capacity of the highways in the immediate vicinity of those four landfills?

A. Yes.

Q. And that conclusion is basically set forth at the bottom of page 9 and the top of page 10 of the report; is that correct?

A. That is correct.

Q. And then the next thing that you looked at was, with this increase in traffic was there a possibility for

accidents that might occur?

A. Yes.

Q. And what methodology -- well, let me back up before I go to that. Was the method that was used by McKeen Engineering standard and accepted in the civil engineering community?

A. Yes.

Q. Moving on, then, to the traffic accident report that was done, what was the methodology that was used here for trying to calculate the potential accident impact of the increased truck traffic volume?

A. Well, we list in the report two sets of statistics. One was calculated by Gordon McKeen, and he used statistics based on the National Center for Statistics and Analysis. And just based on the number of truck miles that were going to be traveled, he compared that to different types of accidents and fatalities.

Q. And then there was also an additional analysis that was aimed more specifically at the type of truck that would be used in this hauling, was there not?

A. Yes.

Q. And what was that conclusion and how was it -- or what data set was it based on?

A. The data set, that was prepared by Professor Hall at University of New Mexico civil engineering department.

Q. And what did Professor Hall conclude?

A. He used the same mileages that Gordon McKeen uses, but his statistics -- he came up with statistics that are a little higher in terms of accidents.

Q. And his conclusions were what?

A. His conclusions are listed, really, on page 11 of the report, which is the .85 to 2.53 fatalities per year, and then there's a 13.9 to 41 injuries per year, and the 35 to 104 property damage only accidents.

Q. Okay. And were the methodologies that were used by McKeen and by Professor Hall standard and accepted within the civil engineering community?

A. Yes.

Q. Okay. Now a number of the factors in this report are based upon estimates of volume and traffic -- and travel distance, are they not?

A. They are.

Q. And so if there was to be some adjustment in the travel distance, that might have some impact on the number on a more or less linear basis?

A. Yes, it would.

Q. And would that reflect on -- would that fundamentally change the conclusions presented in this report if those numbers were to be adjusted somewhat up or down?

A. No.

Q. So there would still -- it would be your testimony that we would still expect to see some increase in air emissions, some amount of damage to the roadways and some number of traffic accidents as a result of the proposed rule?

A. Yes.

Q. Does this report fairly and accurately reflect the work that was done by you or by the people that were working by you as part of this project?

A. Yes, it does.

MR. HISER: Okay, thank you.

Mr. Chairman, we would move the admission of industry committee Exhibit Number 10.

CHAIRMAN FESMIRE: Any objection?

MR. BROOKS: No objection, Mr. objection, Mr. Chairman.

MS. FOSTER: No objection.

MR. JANTZ: Not -- I object as well. I would like to cross-examine the witness on some of this information as well.

CHAIRMAN FESMIRE: You'd like to take the witness on voir dire to determine the admissibility of the report?

MR. JANTZ: Yes, Mr. Chairman.

CHAIRMAN FESMIRE: Okay. Mr. Hiser, do you

object to that?

MR. HISER: No.

CHAIRMAN FESMIRE: Okay. Mr. Jantz, why don't you go ahead and do that.

MR. JANTZ: Thank you.

VOIR DIRE EXAMINATION

BY MR. JANTZ:

Q. Good morning, Mr. Pease.

A. Good morning.

Q. My name is Eric Jantz. I'm representing the Oil and Gas Accountability Project.

I just want to take -- ask you a few questions about your background.

You say you have an education in civil engineering and that you are a certified engineer in New Mexico; is that right?

A. I'm a licensed engineer --

Q. Licensed engineer.

A. -- yes.

Q. What does a civil engineer do, exactly?

A. Civil engineering encompasses quite a few different disciplines, and that might include steel design, concrete design, transportation, water issues, environmental issues, geotechnical issues.

Q. And what's been your experience, work experience?

A. Well, I -- the consulting firms that I've worked for were all environmental firms. My expertise is more in soil mechanics and geotechnical engineering.

Q. Okay. And in your eight years of private consulting, has that been the main focus of your expertise? Soil mechanics, you said?

A. Soil mechanics, yes, and environmental engineering.

Q. And what does environmental engineering entail?

A. Environmental engineering entails everything from releases into the environment, like petroleum contamination in the soil or water or even air emissions like we're talking about today.

Q. So you've done hydrological modeling?

A. Yes.

Q. You've done air modeling?

A. I've not done air modeling, no.

Q. Haven't done air modeling?

A. No.

Q. What about your four years with the Corps of Engineers? What did you do there?

A. I was -- at the Corps of Engineers I was in the geotechnical section, and so in geotechnical we're responsible for pavement design, road design, airport runway design, and then also foundations, drilling. We're

responsible for the dams around the state, also in southern Colorado, part of Texas, all of New Mexico. Levees, of course.

Q. Right, sure. So going back to your experience with air modeling or lack thereof --

A. Uh-huh.

Q. -- what exactly -- can you describe exactly your experience with dealing with air emissions?

A. I don't have much experience dealing with air emissions, and that is why for this portion of the report, then, we brought on Brenda Ramanathan that did all of the air emissions analysis.

Q. Did you directly supervise Ms. Ramanathan?

A. I was a compiler of the reports. I didn't directly supervise her, she was subcontracted to me and I compiled the report --

Q. Okay.

A. -- and Brenda did the analysis.

Q. What about Mr. McGee --

A. McKeen.

Q. McKee?

A. McKeen.

Q. McKeen.

A. Yes.

Q. With an "n".

A. Yes. M-c and then K-e-e-n.

Q. Okay, got you. Did you directly supervise Mr. McKeen's work?

A. No, I didn't directly supervise their work. They're experts.

I received their work, compiled it, and of course I checked it and then brought it all together in the report that we have here today.

Q. And what about Professor Hall?

A. Professor Hall I did not deal with directly. He was actually -- he was contacted by Gordon McKeen. And so Professor Hall and Gordon McKeen worked together.

Q. Okay. And you say that the statistical analysis that Mr. McKeen did -- the conclusions that Mr. McKeen reached, based on his statistical analysis with respect to traffic accidents, was different than the conclusion that Professor Hall reached? Did I understand that correctly?

A. Yes, you did.

Q. Okay. And are you able to say why that's the case? I mean, did you check their numbers, go through the statistical analysis as well?

A. No, I just checked their calculations, and Gordon McKeen felt very comfortable with the deterioration of the pavements, but he thought that he should have some assistance on the fatalities.

So he did one simple analysis using various statistics, and then he approached Professor Hall at UNM who I think did a little more thorough analysis, used some different statistics and maybe some different truck types.

Q. Okay. So let me see if I get this right.

In terms of the contents of this report, you were directly responsible only for dealing -- calculating the landfill capacity part; is that correct?

A. That's what I worked on, yes.

MR. JANTZ: Okay, thank you. Nothing further.

CHAIRMAN FESMIRE: I believe Commissioner Olson has a couple of questions.

COMMISSIONER OLSON: I've got one.

CHAIRMAN FESMIRE: Would you like to --

MS. FOSTER: Mr. Chairman, I'm sorry, I was a little bit confused. I thought that this line of questions was just to have the exhibit admitted to evidence. We will have the opportunity to --

CHAIRMAN FESMIRE: Yes, ma'am.

MS. FOSTER: -- question this witness -- Thank you.

CHAIRMAN FESMIRE: We're just talking about voir dire on the admissibility of the exhibit.

MS. FOSTER: Thank you.

COMMISSIONER OLSON: Well, I don't have anything

on the admissibility.

I have a question on the report itself, so I'm not sure if that's -- this is an appropriate time --

VOIR DIRE EXAMINATION

BY CHAIRMAN FESMIRE:

Q. Mr. Pease, would -- I notice that Professor Hall's portion of the report is signed, but it's not sealed; is that correct?

A. Yes, Commissioner, that is correct.

Q. Would you have been able to -- under your seal, would you have been able to seal this report if you'd been asked to do that?

A. I could -- I believe, if I felt that it was -- everything was just and I agreed with the calculations, yes, that I could seal everything under my name, and then I would thus be responsible for it.

Q. You're turning into a lawyer here. The question was, can you seal this report under your seal now? Are you in enough of a responsible author- -- a position of responsible authority and enough responsibility for this report to tell us as a registered professional engineer that everything in there is valid?

A. Yes.

CHAIRMAN FESMIRE: Okay. The Exhibit 10 will be admitted for the purposes of this hearing.

Mr. Hiser, would you continue, please?

MR. HISER: Actually, we don't have any additional questions of this witness, and we'd be happy to tender him for cross.

CHAIRMAN FESMIRE: Okay. Ms. Foster, do you have anything of this witness?

MS. FOSTER: I do.

EXAMINATION

BY MS. FOSTER:

Q. Now sir, have you read through the provisions of this rule in preparation for your testimony here?

A. No --

Q. All right --

A. -- I have not.

Q. Now when you spoke to the NMOCD concerning the landfills, which landfills did they relate to you?

A. I don't recall which landfills they were. They related -- I'm trying to recall this.

I believe it was three of them, and then I called the owners of the landfill and asked them if they accepted this type of residue, and they said yes, and oh, by the way, there's one more.

And so I believe I received the names of three of them from the OCD, and then the fourth one by talking to the owners of the landfills.

Q. Okay. Now were any of those landfills in southeast New Mexico?

A. Yes, they're all in southeast New Mexico.

Q. Okay. And were any of those landfills in Sierra or Otero County?

A. Oh, goodness... No.

Q. No, okay.

Now the special provisions section of the rule actually states that no pits will be allowed in Sierra or Otero County, right? That means that there will be closed-loop drilling in both of those counties.

Could you estimate how many -- in your opinion, would a drive from Sierra County or Otero County be greater than 100 miles to those landfills?

A. I -- interestingly enough, no, I can't answer that. I'm not sure where those counties in relation to this map that I have here. I apologize.

MS. FOSTER: Okay, I have no further questions.

CHAIRMAN FESMIRE: Mr. Jantz, do you have any questions of this witness?

MR. JANTZ: No, Mr. Chairman.

CHAIRMAN FESMIRE: Dr. Neeper?

DR. NEEPER: Yes, we have some questions.

CHAIRMAN FESMIRE: Why don't you go ahead and ask your questions?

CROSS-EXAMINATION

BY DR. NEEPER:

Q. Good morning, Mr. Pease.

A. Good morning.

Q. I know we met earlier, but I will again introduce myself. I'm Don Neeper, I'm authorized to speak on behalf of New Mexico Citizens for Clean Air and Water.

A. Okay.

Q. I'm a physical scientist by trade, not a legal professional.

I understood you to say this morning that this report was prepared before you understood what would be the correct hauling distances to landfills; is that correct?

A. It was prepared using average distances. And those were given to us by the committee, so we didn't actually calculate those at Daniel B. Stephens. We used the numbers that were provided to us.

Q. But you did assume in preparation of this report that, for example, wastes from the northwest might be hauled to landfills in the southeast; is that correct?

A. That is correct, yes.

Q. So would that mean that the estimates that you have here of such things as carbon dioxide emissions would be wrong?

A. It's -- I wouldn't say that they would be wrong,

they would be adjusted depending on the mileages.

Q. Well, adjusted. Now you've come into this hearing --

A. Uh-huh.

Q. -- and given a number, and this is a pretty solid number that I think propagates into the testimony of other witnesses. Can you provide us with the correct number?

A. There is no correct number. Everything based in this report is based on averages and statistics, and that's why in the report you see minimum distances traveled up to maximum distance traveled. It could be any range in there. So there is no correct number.

Q. Well, we could derive an estimate just using very simple arithmetic, could we not, and come up with at least a reasonable guess?

A. There's -- there's an estimate here that is based on some sound information and sound statistics. Now you can -- you can --

Q. But you just told us the information was wrong.

A. No, I did not say the information was wrong. I said that the information was based on averages. And there's decent averages, there's founded averages, and then of course if you just wanted to make up a number you could do that, and the probability of that being near the truth is probably very low, so...

Q. But if you assume the haul distance from the northwest to the southeast --

A. Uh-huh.

Q. -- the probability of that being true is apparently very low too; is that not correct?

A. No, that is not correct, because the haul distance is the haul distance. I mean, there's a distance, and we took an average, so we said okay, if the values are coming from this section of the state we'll average what the distance is down to this portion of the state. That's perfectly legitimate.

Q. I'll approach the question one more time. Your averages include hauling from the northwest to the southeast; is that correct?

A. Yes.

Q. And you have since preparing the report understood that such hauling would not be necessary; is that correct?

A. No.

Q. Okay, thank you. We'll go on to other questions.

In the assumptions in your Table 5a you derived -- or presented some volumes of solids to be hauled. In obtaining those volumes, were the pit wastes diluted with clean soil or other material, or did you assume simply the solid waste that would come out of the pit without

dilution?

A. Those values were determined -- the volumes were given to us by the committee. And then those volumes were reduced, assuming a 40-percent water content. The densities were reduced.

Q. I'll try to clarify the question.

A. Okay.

Q. A committee provided you with a volume that would come from the pit or from somewhere, and then you reduced that volume by 40 percent, namely, you assumed you would have to haul 60 percent of that volume?

A. No, no, I apologize, I didn't -- we didn't -- it wasn't the volume that we reduced. We received a volume of material that would have to be hauled. And then we also received an approximate dry weight of the solid material.

Now -- then Gordon McKeen assumed that having drilling mud in it, that it would have a volumetric water content of about 40 percent.

So we didn't consider just solid material, we reduced the weights of that, if you will, and we converted from volume to weight to accommodate the presence of the water.

Q. I understand.

A. Okay.

Q. You essentially added back the water to the dry

material, water that would probably naturally be there somehow?

A. Yes.

Q. But you do not know if the volume that you have used represents exactly the pit waste or if it represents the pit waste diluted by one or two or three times its volume with dry soil material?

A. No, I -- we just -- we received a density, an estimated unit weight, and then we added in a particular water content reducing that density down to about 112 pounds per cubic foot.

Q. Do you know if any other witness would be able to tell us where these volumes came from and whether we're hauling the dry soil or whether we're hauling just pit waste?

A. No, the volumes came from the technical committee. They provided us this information.

Q. I keep hearing numbers in this proceeding of, somebody else gave me the numbers.

A. That's correct.

Q. I'm looking for who is responsible for the number and where did the number come from? What is the number?

CHAIRMAN FESMIRE: Dr. Neeper, perhaps Mr. Hiser can clear that up. Who is the technical committee?

MR. HISER: Mr. Chairman, the technical committee

is a group of representatives designated by members of the New Mexico industry committee. It was chaired by Dennis Newman, and they came up with the average volume based on the depth of the wells -- the depth of the wells that would be dug, and that's summarized towards the end of this report where it shows a number of the assumptions that were used by the industry committee in coming up with that which were then provided as the volume estimates to Mr. Pease.

CHAIRMAN FESMIRE: So the technical committee has nothing to do with the people that were appointed to the task force or anything else --

MR. HISER: No.

CHAIRMAN FESMIRE: Okay.

MR. HISER: So the technical committee was an internal thing to the industry committee.

CHAIRMAN FESMIRE: Okay. Will any members of the technical committee be presented for cross-examination?

MR. HISER: It had not been our intent to do that. I suppose we could to some extent -- I'd have to talk with my boss, but -- if it becomes very necessary.

But I think that if you look in the back of this report you'll see that it talks about the depths and gives volumes and all that, which should answer most of Mr. Neeper's questions.

CHAIRMAN FESMIRE: Okay. I think it would be

important to have a witness testify to that, because other than that this witness is just saying, I used the numbers given to me and I ran through this academic exercise. And I think we need to establish where those numbers came from and the accuracy of those numbers.

MR. HISER: Well, I -- Mr. Chairman, with respect, that's -- typically anything that an expert can do is to get information from the underlying industry sources, and that's what essentially was done in this case. So I don't see that this differs very much from the work of any other expert in terms of that.

If it's the pleasure of the Commission that we do that, I don't know that we have any industry representatives who are necessarily authorized to speak. So it'll take us a little bit of time, if you want us to pursue that, to see if we can get that approval to do.

CHAIRMAN FESMIRE: Well, Mr. Hiser, I think it's up to you, but I think there is a -- you know, a gap in the credibility here if that's not presented. But it's up to you.

MR. HISER: Well --

CHAIRMAN FESMIRE: If your witness is going to say, I don't know where those numbers came from, we haven't examined those numbers, but I did it right when they came to me, that's one argument. It's entirely up to you and

your client.

MR. HISER: Well, I think the witness can probably speak as to whether, based on his experience, the numbers are reasonable for what they were portrayed to be, and we could do that. And I will talk with the industry committee and see what its pleasure is and report back to the Commission.

CHAIRMAN FESMIRE: Okay. Dr. Neeper, go ahead and continue, please.

Q. (By Dr. Neeper) Thank you. As you probably know, sometimes the contents of pits are mixed with dry soil to make them more dry. Is there any technical reason why the original, just wetter material could not be hauled, thereby reducing the required volume for hauling?

A. I -- again, with the materials that came from the pits, I used the volumes that were provided. And we assumed that the maximum moisture content that they would have would be about 40 percent. And so we reduced the density to that. That was done by Gordon McKeen, and that was the number that he used to calculate weights to determine detriment of pavement.

Q. I'll try to rephrase the question.

A. Okay.

Q. If I have some wastes in my pit and I'm an operator --

A. Yes.

Q. -- let's hypothesize, and they are solid but very muddy, of a consistency I could squish almost between my fingers, except for the chunks of cuttings that might come out, would there be any legal or mechanical reason why that material could not be put in a truck and hauled in that form?

A. If -- from my understanding, if -- I mean, if -- it could be hauled in that form, as long as it's not leaking out of the truck at all. I mean, you don't -- you would have to have maybe -- if it behaved in a fluid manner, you might have to have some kind of impermeable barrier on the inside of the truck.

Q. But from an engineering point of view, there isn't a reason why it couldn't be hauled?

A. Not that I'm aware of.

Q. All right. You have testified that there is expected damage to the roads from the truck traffic that would be generated as a result of this rule.

Am I correct in understanding that all trucks pay taxes, presumably to cover their use of the roads in New Mexico, and would these trucks not pay the same taxes?

A. That, I don't understand how the roads are funded with taxes, no. I'm more of a technical expert, I'm sorry.

Q. I'll try to rephrase the question then. Do you

know of any reason why these trucks would not be paying taxes to cover their damage to the roads, the same as all other trucks crossing the state presumably pay their fair share of highway --

A. I wouldn't -- no, I would not know why.

Q. You have used in your estimates a truck with a 14-yard capacity.

A. Yes.

Q. Is there a technical reason why one could not use a 20-yard-capacity truck?

A. No, the volume of the truck, if that was available, you could change that volume and thus change some of those calculations in terms of number of trips.

Q. I'll revisit that question. So if we were to assume use of a 20-yard truck instead of a 14-yard truck, we should be able to reduce the number of trips and the number of emissions and perhaps even costs by something like the ratio of 14 to 20; is that correct?

A. You would -- you would be able to reduce it, yes.

DR. NEEPER: Thank you, no further questions.

CHAIRMAN FESMIRE: Mr. Brooks?

MR. BROOKS: Thank you. May it please the Commission.

CHAIRMAN FESMIRE: Do you want to get back into sync, or are you going to do this from the left seat?

MR. BROOKS: Well, I --

CHAIRMAN FESMIRE: I know that you're very compulsive about this kind of thing.

(Laughter)

MR. BROOKS: Well, I don't really care. I think I can just sit here, Mr. Chairman, if that's acceptable. I used to fly airplanes from the left and right seat interchangeably, so I guess I can cross-examine.

CROSS-EXAMINATION

BY MR. BROOKS:

Q. Good morning, Mr. Pease.

A. Good morning, sir.

Q. I want to understand in a somewhat nontechnical way what you have done here. Basically, is not what you have done to compute a number of additional truck miles that will be driven because of this rule, in your opinion, and then used that number to compute all the other things that you believe would be a consequence of that?

A. I didn't -- we didn't compute the truck miles, we used the truck miles that were estimated by the committee. And from those, yes, we determined the pollutants that might be emitted from those trucks and the damage to the pavement, and then analyzed as well some of the statistics in terms of accidents and fatalities on the highways.

Q. But everything you conclude is basically a

function of how many additional trucks will be on the road and how many additional miles they'll drive?

A. That is correct, yes.

Q. Okay. I want to call your attention to page -- I think it's page 2, actually, of your report, although I took it out of the report -- this map --

A. Yes.

Q. -- and Mr. Simmons -- I mean, Mr. Pease, I'm really obliged to you for furnishing us this map. When this proceeding is over I'm going to take this map out and hang it on my wall, because it gives me a real easy, ready reference for finding anything in southeast New Mexico. And I have other maps, but this one is a lot easier to use. So I'm obliged to you, producing this map for us.

But that aside, you have marked four landfills on this map, correct?

A. Yes.

Q. The Sundance Parabo in Lea County, Controlled Recovery and Lea Landfill over in western Lea County, and then the Gandy Marley landfill up in Chavez County, correct?

A. Yes.

Q. These were the four that you were told about by the Oil Conservation Division?

A. I believe I was told about three of these from

the Oil Conservation Division, and the fourth one I found out about from talking to the owners of these other landfills.

Q. Now did you assume that all of the waste generated from oil and gas production anywhere in New Mexico would be hauled to one of these four landfills?

A. I did assume that, yes.

Q. What inquiries did you make to determine if there were any other landfills that might be available?

A. I -- as I mentioned, I called OCD and asked them which certified landfills there were, and then I called these owners and asked them if they knew of any. And I came to the conclusion that these were the only four.

Q. And you did not contact the New Mexico Environment Department about landfills?

A. I don't recall, that, sir. I --

Q. And you did not -- Well, you said you talked to some landfills, right?

A. I'm sorry?

Q. You said you talked to some landfill operators; did I hear you say --

A. Well, the owners of some of these, yes.

Q. But those were these landfills, not other --

A. Yes.

Q. -- landfills?

A. No. No, it was these.

Q. In other words, you did not make any investigation as to whether or not any of the solid waste landfills in the state that are permitted by the Environment Department and not by OCD would be available as repositories for oil and gas waste?

A. No, I looked into that and I determined that these four landfills could take this type of residue at the time that this report was written.

Q. Well, my question is, did you look into the availability of other landfills?

A. No, I was -- I didn't think that other landfills could receive this type of waste.

Q. So you assumed that other landfills would not be available?

A. Yes, when I prepared this report, I did.

Q. Now are you aware -- I know you responded to Ms. Foster's question, you said that you had not made a study of the rule, the proposed rule, for the purposes of this --

A. Right, that's correct.

Q. Are you aware that the proposed rule only requires the hauling of waste to landfills if the well in question is within a 100-mile radius of an approved disposal facility?

MS. FOSTER: I would object to that statement,

Mr. Chairman.

CHAIRMAN FESMIRE: I'll overrule the objection.

MS. FOSTER: Okay. Can I give you my basis for my objection?

CHAIRMAN FESMIRE: Sure.

MS. FOSTER: Okay. Pursuant to the special provisions section of the rule, which I believe is part of this hearing, which I asked this witness about, about Otero and Sierra Counties, it's very clear that under that rule the 100-mile -- the 100-mile rule is not part of that provision of the rule. So therefore Mr. Brooks' statement that, Are you aware that you only have to haul if you're outside of the 100-mile radius?, is inaccurate.

CHAIRMAN FESMIRE: Okay, Mr. Brooks, why don't you go ahead and clarify that Rule 21 might be an exception to your statement and proceed with your questioning.

Q. (By Mr. Brooks) Okay, let me restate my question.

Are you aware that with the exception of wells that might be located in Otero and Sierra Counties --

CHAIRMAN FESMIRE: -- which are not part of this rule --

MR. BROOKS: -- that --

MS. FOSTER: Well, Mr. Chairman, again --

CHAIRMAN FESMIRE: Ms. Foster, it was overruled.

MS. FOSTER: Well, again --

CHAIRMAN FESMIRE: Would you like to make another objection?

MS. FOSTER: Oh, yes, I would. Just so the record is clear, it's my understanding that yes, we are here for Rule 17. However, the Division did give us several other rules which are impacted by this proceeding, Rule 21 being one of them. So therefore it should be part of this discussion.

MR. BROOKS: Well, it is --

MS. FOSTER: Your statement, Mr. Chairman, that this is not part of -- Rule 21 is not part of this hearing --

CHAIRMAN FESMIRE: Rule 21 -- Is there any provision of the proposed changes that will involve Rule 21, Mr. Brooks?

MR. BROOKS: Yes, Mr. Chairman, there is, because there's a cross-reference in Rule 21. Rule 21 presently says that no permits for pits will be issued under 19.15.2.50, NMAC, and we're going to -- we propose to change it to say no pits -- no permits will be issued in those areas under 19.15.17 NMAC.

CHAIRMAN FESMIRE: So there's no functional difference, it's just --

MR. BROOKS: No, it's simply a change in cross-

reference, because we have a history in OCD, unfortunately, of having archaic cross-references in our rules, and in putting this rule together we made an effort to avoid -- to make corrections that would avoid doing that.

MS. FOSTER: Well --

CHAIRMAN FESMIRE: Well, Ms. Brooks, I think Mr. Foster -- I mean, Ms. Foster, I think Mr. Brooks clarified his question to point out the difference in Rule 21.

MS. FOSTER: Well, then Mr. Brooks is incorrect. If I could read from Rule 21, it specifically states in section B, The Division shall not issue permits for pits located in the selected areas. It does not say about any pits under this rule. It specifically states no pits will be allowed.

It does not -- In other words, there's not --

CHAIRMAN FESMIRE: And how does Mr. Brooks' question not address that when he said with the exception of that part of Sierra and Otero Counties covered by Rule 21?

MS. FOSTER: Because I want to clarify your statement, Mr. Chairman, that Rule 21 is part of this discussion here, because the closed-loop -- since closed-loop will be mandated in Sierra and Otero Counties --

CHAIRMAN FESMIRE: Ms. Foster, I don't think that's the rule. I think the rule says that no pit will be

allowed --

MS. FOSTER: No pit --

CHAIRMAN FESMIRE: -- in section 21 -- I mean in Rule 21; is that correct?

MS. FOSTER: That's right.

CHAIRMAN FESMIRE: Okay.

MS. FOSTER: But I -- if I understand Mr. Brooks's statement just now, I believe that he stated that it was going to be -- that it was just a procedural process where anywhere in a statute that Rule 50 is referred is now going to be changed to Rule 17. That is not quite the case.

CHAIRMAN FESMIRE: Ms. Foster, I overruled your objection.

MS. FOSTER: Okay, thank you.

CHAIRMAN FESMIRE: Okay. Mr. Brooks, continue, please.

Q. (By Mr. Brooks) Okay. Mr. Pease, with the exception of Otero and Sierra Counties, are you aware that the proposed rule only requires the hauling of oil and gas waste to landfills if the well in question is located outside of a 100-mile radius from a --

CHAIRMAN FESMIRE: Mr. Brooks --

MR. BROOKS: -- approved landfill?

CHAIRMAN FESMIRE: Mr. Hiser?

MR. HISER: I would, I guess, have to make a similar objection to Ms. Foster's, which is that in fact the rule actually says that it also has to meet a series of closure criteria before you could actually dispose of that waste, and that's a necessary part of this rule, as well.

So if a pit doesn't meet those closure criteria, it can't be closed in place and would still require being hauled.

CHAIRMAN FESMIRE: I'll sustain that objection. Mr. Brooks, would you rephrase your question again, please?

Q. (By Mr. Brooks) Okay, I'll try again.

Are you aware that the requirement of hauling that -- that waste be hauled to a landfill from an oil and gas pit or a closed-loop system, applies only to wells located outside of a 100-mile radius from an approved facility, with the exception of Otero and Sierra Counties, and with the exception of waste that does not meet treatment standards?

Because of the objections I've had to make that a very complicated and convoluted question, but are you aware of those provisions of the rule?

A. No, I'm not.

Q. And did you assume that waste would be hauled to landfills from anywhere in the state, regardless of the distance to the nearest landfill?

A. Yes.

Q. And did you come up with distances as much as 400 miles or so, that you used in your calculations?

A. Yes.

Q. Okay. Now, are you -- did you familiarize yourself with where wells are located in the State of New Mexico?

A. No.

Q. Did someone provide you some figures on that subject?

A. No, they -- the committee that I've spoken of provided us -- I did see a map that showed the wells situated around the state, and then just from each quarter of the state we were given volumes of material and distances, and that's what I used to base my calculations on.

Q. Okay. And a very large volume of that waste comes from northwestern New Mexico, right?

A. I -- Give me a second, I can tell you, sir.

Q. Please.

A. Yes.

Q. And northwestern New Mexico, for the most part, is going to be more than 100 miles from any of these facilities you've located on the map on page 2 of your report, is it not?

A. Yes.

Q. Thank you. What level of drilling activity did you assume for purposes of this report?

A. I didn't assume anything about drilling, sir.

Q. Well, if you're going to have some figures on hauling waste from pits, doesn't it have to assume a certain number of pits to have any validity?

A. Well --

Q. Or at least a range of numbers of pits?

A. If you look on the report, Appendix A, the first table, this is the information that was provided to us. And so we just took that information and performed the calculations that I described to you earlier. I didn't make any assumptions that involved anything to do with the drilling pits, et cetera.

Q. So your assumption is based on the fact -- on somebody'd providing you with some hypothetical number of amount of pit waste that will be generated, and not on anything -- any figures that you've computed or examined to determine that?

A. That's correct.

Q. Very good, thank you. Now I believe that's most of what I have to ask you, but I have one more question.

Your assumptions about -- Well, maybe I have some more than that, but I'll ask this one first.

Your assumptions about emissions, would that be based on the present portfol- -- the present portfolio of trucks that might be available now?

A. It was based -- I believe in that section of the report she had based it on data up through 2004.

Q. And it doesn't take into consideration whether or not there might be improvements in vehicle efficiency in the future that might reduce that amount of emissions?

A. Not in the future, no.

Q. Okay. Let me review some questions here, and then I will...

Now this is based just on truck traffic, it would be -- doesn't have anything to do with the type of material, your conclusions are not dependent in any way on the type of material hauled; is that correct?

A. That's correct.

Q. So whether they were hauling waste from wells or whether the trucks were hauling machinery to drill wells, it wouldn't make any difference so far as your calculations are concerned?

A. It would make a difference in terms of the assumptions that we made that the 14-cubic-yard truck was full, and so that had specific weights associated with it and thus a certain number of trips.

And so if the weight of the load changed, then

that might change the number of trips, deterioration on the pavements, or the air emissions is a function of the number of trips as well.

Q. But for a given truck weight and a given number of trips, your assumptions have nothing to do with what the particular type of cargo on that truck is?

A. I would like just a second to answer that, please.

Q. Okay, you may have it.

A. No.

Q. They do not, correct?

A. Correct.

Q. Now just going back to what I asked you about northwestern New Mexico, you assumed that there were no landfills available in northwestern New Mexico?

A. That is correct.

Q. But you would not think it reasonable, would you, to assume that if there was a landfill available in northwestern New Mexico, that a -- that could take this type of waste, that an operator would truck it 400 miles to southeast New Mexico instead of disposing of it at a landfill within a few miles of the well site?

A. No, that's correct.

Q. And so to the extent that you assume that that would happen, and assuming such landfills exist in

northwestern New Mexico, your report is flawed, right?

A. No, the general -- the number of trips involved in transporting is going to add pollutants to the atmosphere and is going to damage the roads. And so the amount of that might vary some, but the conclusions of the report do not change.

Q. Between a 400-mile trip and a 40-mile trip, the amount that -- of difference is going to be substantial, is it not?

A. It may.

MR. BROOKS: Thank you. I'll pass the witness.

CHAIRMAN FESMIRE: Commissioner Bailey?

EXAMINATION

BY COMMISSIONER BAILEY:

Q. I'm looking at Table ES-1 on page ES-3. It appears as though the only financial figures you have are for the first line for the annual business impact.

Although we cannot put a value on a human life, did you try to apply any financial figures to the repair and maintenance of these roads that would be borne by the citizens of the state?

A. No, I did not.

Q. In your discussions with the privately held landfills and landfarms down in the southeast, was there any indication that they would hold the line on disposal

costs or, since they are -- since they have the ability to hold the entire southeastern industry hostage to their facilities for disposal, was there an indication that they would raise their prices to whatever they could charge?

A. There was no indication of that, no.

COMMISSIONER BAILEY: That's all I have.

CHAIRMAN FESMIRE: Commissioner Olson?

EXAMINATION

BY COMMISSIONER OLSON:

Q. Yes, Mr. Pease, I guess just following up on Mr. Brooks, it looks like from your calculations -- I don't know, it says page 1, but I think there's a few page 1's here, of Appendix A. You're looking at -- at 1400, I guess, wells per year. That's what your calculations are based on?

A. Yes, Commissioner.

Q. And so this is assuming that all wastes are dug and hauled to a landfill from every well drilled?

A. I -- These numbers I just used from my calculations, Commissioner, so I didn't perform these calculations that you see on this page. This page is the information that was provided to us that we used to perform our calculations.

Q. Well, I'm just trying to understand your calculations. Is your calculation based upon wastes from

every well that's drilled in the state being dug and hauled to a landfill?

A. I believe it is, yes.

Q. Do you understand that the rule doesn't require that -- even as proposed by the Division with the 100-mile radius, doesn't require all wells to be dug and hauled to a landfill?

A. No.

Q. Okay. And so that would affect your calculations -- if some sites, based on what are siting criteria, and even the radius, I guess, would be allowed to be buried on site, that would affect these calculations, then?

A. Yes.

Q. And is there any estimate of the costs -- well, I guess, I'll back up. I guess you weren't here for testimony from the Division, then, that there are disposal options in the San Juan Basin, there are some facilities up there that it could go to?

A. No, I as not here for that.

Q. And I think even -- you weren't here for the testimony, then, of Sam Small, who's also assuming that wastes would be disposed of at facilities in the San Juan Basin?

A. I was not here for that either.

Q. And I believe Mr. Small, for the -- testified on

behalf of IPANM, was estimating a maximum of 100 miles for a hauling distance as a worst-case scenario.

What would be the -- Is there any way you could give an estimate of what the change in these figures would be by using a 100-mile maximum hauling distance?

A. I would not want to speculate on that unless I redid these calculations, no, but there -- the distances that we did assume are listed on this table, the shortest and the longest, then, from each section of the state.

Q. Right, but I'm thinking, particularly for the northwestern New Mexico --

A. Yes.

Q. -- the IPANM assumed a maximum hauling distance of 100 miles, which would be a 100-mile radius for where you would be required to haul wastes, so it seems to me that in your -- I'm looking at page 1 of Appendix A, down in the middle, the fourth table down, it's got transport distances and its using the northwest, shortest mileage of 350 miles and a longest of 450.

If you had a longest of 100, as the IPANM had used, then the shortest could be, I guess, as short as, you know, several miles, depending on where it's located. Probably -- it's probably not an average for shortest, but that's going to significantly change the numbers for costs for northwestern New Mexico, isn't it?

A. Yes, sir, it will have a significant change on some of the parameters we estimated in terms of pollutants in such.

The reason I was hesitant to give you an answer, though, is, the deterioration of the pavements is an accelerated value. So a road that's already deteriorated is going to deteriorate much more rapidly than one that is not deteriorated, so I don't know if there's a straight linear analysis on that portion of the miles traveled.

Q. But there's going to be significantly less deterioration with the shorter hauling distance --

A. There will be --

Q. -- of roads?

A. There will be less deterioration.

Q. And --

A. And Commissioner -- I'm sorry, can I add, though, that --

Q. Sure.

A. -- it's the -- it's really the number of trips in terms of that that's significant. So when a truck is loaded, this equivalent single-axial [*sic*] load, which represents a single-axial load with 18 kips on it, that is what the design engineers use to determine the deterioration of the pavement. So really, it's --

CHAIRMAN FESMIRE: Mr. Pease, you're talking

civil engineering. You're going to have to explain what kips are.

THE WITNESS: That's 1000 pounds, I apologize.

CHAIRMAN FESMIRE: Okay.

THE WITNESS: Yeah. And so really, in terms of the deterioration of the pavement it'll be a function of the number of trips and the number of times that a truck passes over a particular location.

Q. (By Commissioner Olson) But -- maybe I don't understand that. It seems to me that if you're traveling a shorter distance, you're affecting less roadway then.

A. It would be less roadway, but if I took a particular stretch of roadway that was outside of a landfill --

Q. Uh-huh.

A. -- and I considered the number of trips that went into that landfill with a certain weighted truck, that would determine the deterioration of the pavement. So the distance traveled is going to have more of an effect on the air pollutants and the emissions.

But for each -- each section of pavement is only going to feel the effect of a truck driving over it a number of times.

Q. Yeah, I guess -- Well, maybe I'm confused. It seems like if you're using four -- say -- just say 400

miles for --

A. Uh-huh.

Q. -- argument, you'd be affecting that whole 400-mile stretch of highway?

A. Yes, you'll be affecting more pavement.

Q. More pavement.

A. Yes.

Q. So if the distance is less, then the effect on the pavement is less too, because you're affecting less miles of pavement, so the actual cost in highway miles is actually less than highway road mileage?

A. Yes, there -- I think the difference is, there will be less pavement sections affected.

Q. Right, which is less overall impact on roadways, right?

A. The less -- I think we're differing -- the less number of roads will be affected.

Q. Uh-huh.

A. Yes.

Q. And following up, I guess, on a question of Dr. Neeper, I just want to make sure I understand that -- is this -- it's assuming a dig-and-haul of all wastes, but I guess I'm confused. Is this going along lines of -- Mr. Sam Small testified that usually they're taking out, you know, six inches, a foot, whatever, of clean soil

underneath as they're doing this dig-and-haul.

Is that -- these numbers represent waste plus soil, or just the actual wastes that's in the pit?

A. I apologize, Commissioner, but on that I'm not exactly clear. Like I said, those volumes of that material were provided to us, and then we, from that, calculated weights and number of trips, et cetera.

Q. Okay, because I'm a little confused on that. So then you have a different table here for closed-loop systems as well?

A. Yes, I -- there's two tables in that appendix, and we didn't use any of the values off of the closed-loop system, we used the values off of page 1 only.

Q. Okay, so I'll admit I haven't compared the two to see what the difference is, but I'm just kind of confused, I guess, as to what's actually being represented in these numbers, and maybe somebody else will be able to answer that.

Because I -- well, I guess, just along that same line, then, if those numbers are representing hauling of additional material from soils that's dug up as well, that would be significantly more waste volume than would be generated from a closed-loop system, then, wouldn't it? Because you'd just be disposing of the actual wastes with a closed-loop system.

A. I -- unfortunately, I'm not even -- when it comes to a closed-loop -- -looped system versus the other types here, I'm not familiar enough to comment on those.

Q. Okay. And I guess what I'm wondering about is, the industry committee itself that has accepted some portions of the rule and proposed other changes that they feel is more appropriate for cost and a lot of other different reasons.

Have you made any estimate -- I'm kind of curious as to what the costs are of the proposed rule change if we accepted the industry committee's proposed rule change. Have you done any cost estimates of potential impacts under the changes as proposed by the industry committee?

A. We did not do any cost analysis, no.

Q. And the title of this is going towards effects of the proposed rule. Have you looked at any costs related to the protection of water quality and the value of water resources in New Mexico?

A. I have not, no, sir.

Q. But I guess you would acknowledge there is a benefit to prevention of water pollution in terms of a cost-benefit, just in general?

A. If there was indeed -- if you -- if you did think that was a possibility, yes, I suppose.

I apologize, I don't have a definitive answer for

that.

Q. Okay.

A. I did not think in terms at all of water contamination, water resources.

Q. Well, the water resource in New Mexico is -- has a value -- it actually has substantial value in New Mexico, doesn't it?

A. Yes, it does.

COMMISSIONER OLSON: That's all I have.

EXAMINATION

BY CHAIRMAN FESMIRE:

Q. Mr. Pease, I think what you were trying to tell us is that if you take a given volume, which was supplied to you by the industry committee -- or by the technical committee, which is not the same as the industry committee --

MR. HISER: It's a --

Q. (By Chairman Fesmire) Okay, a sub- -- a technical committee that is a subcommittee of the industry committee.

If you take a given volume and haul it a given distance, which was provided to you by the committee, that these would be the effects?

A. Yes, Chairman, that is correct.

Q. Okay. So you don't know what effect it would

have by, for instance, if the amount of drilling was reduced?

A. I would -- numbers would reduce --

Q. Okay.

A. -- yes.

Q. And if the amount of waste at a given site was reduced by a factor of four or more, that would affect your numbers by reducing all these numbers, would it not?

A. Yes, it would.

Q. Okay. So a reduction in drilling, a reduction in waste, or if they were allowed to haul some of this waste to, for instance, a landfill, a landfill that you didn't know existed, that would reduce these numbers, would it not?

A. It would.

Q. And if they were, for instance, in the northwest under certain conditions that they were allowed to haul waste to land- -- say a reduced amount of waste to landfarms, that would affect your numbers, wouldn't it?

A. It would.

Q. Let's look at ES-3, and in response to questions from Commissioner Bailey you indicated that the financial impact didn't include the damage and the costs to repair the roads; is that correct?

A. Yes, that is correct.

Q. But in here under annual business impact you have an estimated number of $50 million to $100 million; is that correct?

A. Yes, and I'd add that that -- the source of that came from the committee. We didn't perform that analysis ourselves.

Q. Okay, so we're back into hypothetical mode again --

A. Yes.

Q. -- but that should include the cost of fuel, should it not?

A. I believe it would.

Q. And road taxes come out of fuel taxes, don't they?

A. I believe so, yes.

Q. So this analysis should include enough of a tax to pay for the extra damage to the road, shouldn't it?

A. That -- I really can't comment on that.

Q. Okay.

A. We didn't do any economic analysis on this, Daniel B. Stephens in this report.

Q. Now you came up with a number of $CO_2$ emissions.

A. Yes.

Q. You didn't compare that to any other emissions sources, did you? For instance, gas-treating in the

northwest?

A. No.

Q. Do you happen to know, if all of these numbers were correct, and the significant number of truck miles that I think you came up with between 27 million and 81 million a year --

A. Yes.

Q. -- what percentage of the total oilfield traffic is that?

A. I'm not sure I understand your question --

Q. Okay, this would be additional miles traveled to haul these wastes, correct?

A. Yes, yes.

Q. You don't happen to know how many miles are traveled by trucks of all kinds and service vehicles and stuff in the oilfield of New Mexico now, do you?

A. No, I do not.

Q. So you wouldn't know what percentage that would be?

A. No.

Q. And you said your background was in soil mechanics, geotechnical engineering and environmental engineering, right?

A. Yes.

Q. And that you've had some experience with roads

and soils, especially with the consulting you've done and with the -- was it the Corps of Engineers?

A. Yes.

Q. And you can't tell us where the committee got their numbers on the haul volumes, things like that?

A. No, we -- The numbers were just presented to us, and we were asked to do these specific tasks, so we just took the numbers that were provided and we did the analysis that's reflected in this report.

Q. Okay. Am I being too harsh to call that an academic exercise, rather than factually based?

A. I believe so. It's -- I'm not sure how I interpret your comment --

Q. Well --

A. -- being academically based.

Q. -- you did the calculations based on numbers that you were given, just like --

A. Yes.

Q. -- an academic problem, you were given these numbers?

A. Yes. But I'd like to add, Chairman, that we did -- I mean, we used statistics. I mean, we researched the statistics to apply the pollution and the roadways, et cetera, to these numbers that were given.

Q. So if -- you would be very sure of your answers,

if you were sure of the input numbers that you were given by the committee?

A. That is correct.

Q. This one is probably in yours, and it's a true question; I'm really not trying to make a point.

In your analysis and the excess mileage, did you include all of the mileage as loaded miles, or was some of it deadhaul?

A. No, it was -- each truck had a loaded distance and an unloaded distance.

CHAIRMAN FESMIRE: I don't have any other questions.

Mr. Hiser, do you have more direct --

MR. HISER: Just a --

CHAIRMAN FESMIRE: -- or redirect?

MR. HISER: I guess a couple of redirects.

REDIRECT EXAMINATION

BY MR. HISER:

Q. Mr. Pease, Dr. Neeper had asked you a couple of questions about the truck damage. Do you remember those? Not the specifics, but that he asked you those questions?

A. About truck damage?

Q. Yes, he was talking about -- he specifically asked you the difference between a 14-cubic-yard and a 20-cubic-yard vehicle --

A. Oh.

Q. -- and a couple of other questions about water and things of that nature. Do you recollect --

A. Yes --

Q. -- that he --

A. -- yes, yes, I do.

Q. -- asked you those questions?

Now, you indicated in that discussion that you weren't aware of an engineering reason for the preference for a 14-cubic-yard truck versus a 20-cubic-yard truck; is that correct?

A. Yes.

Q. In this report, though, on page 7, was there any regulatory reason that was flagged either by you or by Mr. McKeen as being a potential limit in terms of how material has to be hauled?

A. Well, the percentage of water in the material, he used 40 percent, and that's as much as -- water, apparently, that can be in the material.

Q. Okay, and so if in fact that was what -- that may have influenced the choice of the cubic yardage that was being used?

A. It affected the density of the material which, in turn, based on the cubic yardage, affected the weight.

Q. And you also testified that you are familiar with

road and road engineering; is that correct?

A. Yes.

Q. And is it typical for roads and bridges to have weight limits?

A. Yes.

Q. And is there a difference in the weight between a 14-cubic-yard and a 20-cubic-yard truck?

A. Yes.

Q. And on small county roads, is it possible that a 20-cubic-yard truck would exceed the weight?

A. I would assume it would, yes.

Q. And so that might also affect the choice of the truck volume that was used?

A. Yes.

Q. Now in -- Mr. Brooks asked you a question -- a number of questions, actually, about the mileage that you used to calculate the distance that -- the projection that came from the industry committee; is that correct?

A. Yes.

Q. I've got to figure out how to ask this next question.

His question, though, did it not, assumed that the waste would meet the disposal criteria for on-site disposal from -- that the Division has established in the proposed rule, did it not?

A. It would -- yes.

Q. And so if the waste doesn't meet those criteria, it would still have to be hauled, would it not, under the proposed rule as the Division has set it forth?

A. I believe so.

Q. And did -- and I don't know the answer to this either, so I'll find out.

Did the industry committee tell you to assume or not to assume that any waste could be disposed -- met the OCD disposal criteria?

A. No, we didn't elaborate on that.

MR. HISER: That completes my questions.

CHAIRMAN FESMIRE: Are there any other questions of this witness on the subject of the redirect?

MR. BROOKS: No, your Honor.

CHAIRMAN FESMIRE: Mr. Jantz?

MR. JANTZ: No, Mr. Chairman.

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

CHAIRMAN FESMIRE: Commissioners?

COMMISSIONER BAILEY: (Shakes head)

COMMISSIONER OLSON: No questions.

CHAIRMAN FESMIRE: Mr. Pease, thank you very much.

MR. PEASE: Thank you.

CHAIRMAN FESMIRE: Why don't we take a 10-minute

break, at which time we will come back at 20 till?

Who's our next witness?

MR. HISER: It would be Dr. Ben Thomas.

CHAIRMAN FESMIRE: Okay, Dr. Thomas, we'll begin his direct examination.

(Thereupon, a recess was taken at 10:29 a.m.)

(The following proceedings had at 10:45 a.m.)

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

Let the record reflect that this is a continuation of Case Number 14,015, that all three Commissioners are present, there is therefore a quorum present.

I believe we were going to start with the direct examination of Dr. Thomas.

Mr. Hiser, are you prepared to proceed?

MR. HISER: I am.

CHAIRMAN FESMIRE: Would you please do so, sir.

MR. HISER: Thank you, Mr. Chairman.

Dr. Thomas, have you been sworn yet?

DR. THOMAS: Not yet.

MR. HISER: Would you please -- Mr. Chairman, if you could have the witness sworn, please?

CHAIRMAN FESMIRE: Mr. -- Dr. Thomas, would you raise your right hand?

(Thereupon, the witness was sworn.)

BEN THOMAS, PhD,

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

DIRECT EXAMINATION

BY MR. HISER:

Q. Dr. Thomas, could you state your name for the record, please?

A. Yes, my name is Dr. Ben Thomas.

Q. And could you give us an overview of your educational and professional experience?

A. Yes, my -- I received my bachelor's degree from Tulane in biology and chemistry. I received my master's and PhD degrees in pathology at the University of Texas Health Science Center in Houston. That also includes University of Texas M.D. Anderson Hospital and Tumor Institute.

Q. And tell us a bit about your professional experience since you received your PhD and --

A. Did postdoctoral work in biochemistry of cancer and toxicity. My wife suggested I get a real job, so I applied and was hired by Shell Oil Company, and I worked there for 12 1/2 years as a corporate toxicologist responsible for oil products, exploration production, solvents and a variety of other things.

I was chairman of the American Petroleum

Institute's toxicology committee, I was chairman of the API's benzene toxicology task force, I was a member of the Chemical Manufacturers Association's benzene task force, and so on. So I've had a fair amount of industry exposure.

In 1990 I was offered a job as a consultant in the environmental field, so I've been a consultant ever since 1990. My practice involves not only health effects but also environmental sciences as well, including risk assessment and risk-based decision making.

MR. HISER: Mr. Chairman, at this point we would tender Dr. Thomas -- or qualify him as an expert in toxicology and risk assessment.

CHAIRMAN FESMIRE: Is there any objection?

MR. BROOKS: No objection, Mr. Chairman.

MR. JANTZ: I'd like to voir dire the witness, Mr. Chairman.

CHAIRMAN FESMIRE: For the reason of -- ?

MR. JANTZ: To establish the scope of his expertise.

CHAIRMAN FESMIRE: Okay, please do so.

VOIR DIRE EXAMINATION

BY MR. JANTZ:

Q. Mr. Thomas --

A. Dr. Thomas.

Q. Dr. Thomas, I apologize. I'm Eric Jantz. We've

met before, I'm --

A. Yes.

Q. -- the attorney for the Oil and Gas Accountability project. I just wanted to ask you a couple questions about your background. You have your PhD in pathology; is that right?

A. That is correct.

Q. Could you explain what a pathologist does?

A. Well, there are different types of pathologists, but essentially a pathologist is an expert in the processes of disease, so that may involve autopsies. In my training I participated in 40 human autopsies. It may involve research. And in my studies I've worked in, I think, 16 different species of animal.

Pathologists also do the microscopic evaluation and diagnosis of disease, they also will do the clinical testing, the blood test and so on that you see. As part of my professional career, I've done a fair amount also in veterinary work because a lot of toxicology work is with animals.

And so essentially that's -- I hope that answers your question.

Q. It does. Could you expand on your experience as a pathologist --

A. Certainly.

Q. -- a little bit?

A. Certainly. I did my pathology training at M.D. Anderson Hospital and Tumor Institute. It included 40 human autopsies, it included studies in 16 species, including complete necropsy and microscopic evaluation.

I think I have probably seven papers on various types of clinical tests that are affected by disease.

I'm an adjunct professor at the University of Texas Health Science Center, where I teach pathology and -- to the medical students and to the graduate students.

Q. You said you were also, since 1990, a consultant and that you worked in environmental sciences; is that right?

A. That's correct.

Q. Including risk assessment. What does that entail?

A. Risk assessment is a formal process of evaluating essentially analytical data. It's a process by which you now start to evaluate which chemicals are high enough concentration to be of concern, so -- you know, that's kind of a simplistic explanation, but I -- pleased to go into further detail if you want.

Q. And what has your experience with risk assessment involved during your career?

A. I've been the lead consultant on a number of risk

assessments, everything from Superfund to RCRA, air permitting, research programs, detailing hazardous air pollutants. I'm not quite sure what you're --

Q. Okay, I just -- I'm -- these are actual -- I'm not sort of trying to make a point, I'm trying to get sort of an idea of where you're coming from.

Do you have experience doing air modeling of any sorts in your time as a consultant?

A. Generally the air modeling is done by my staff.

Q. Okay.

A. I certainly have experience in interpreting air modeling.

Q. Okay, what about groundwater?

A. Groundwater, groundwater plume and analysis, yes.

Q. Okay. Contaminant transport, do you have experience modeling contaminant transport?

A. Ambient?

Q. Contaminant transport, sorry.

A. Oh, contaminant. Yes, I do. Yeah, again most of the modeling is actually done by my staff --

Q. Okay.

A. -- as opposed to me personally.

Q. Right, okay. Do you have a background or experience in economics at all?

A. I've done some economic studies. Again, I depend

upon the expertise of people that work for me.

Q. Okay, what about engineering? Civil engineering, specifically?

A. I don't claim to be a civil engineer.

Q. Okay, okay --

A. I've worked a lot with civil engineers.

Q. All right, one last thing. Looking at your résumé, you seem to have a lot of experience -- a lot of industry experience. Have you ever consulted with or worked on behalf of community organizations, something like the Oil and Gas Accountability Project, or the American Lung Association? You kind of get my point.

A. Yeah. Not with what I'd consider to be environmental-type organizations, primarily because there's a -- you know, a common conflict of interest because of my industry background.

Q. Sure.

A. I have worked on cases where I thought there was merit in claims of individuals against industry.

Q. Uh-huh.

A. I've worked on behalf of the Louisiana Department of Natural Resources with regard to their waste management rules, their Statewide Order 29.D.

Q. Okay.

A. So I've worked just about everywhere.

MR. JANTZ: Okay, great. Thank you, that's all I have of Dr. Thomas.

CHAIRMAN FESMIRE: Is there any objection to Dr. Thomas being admitted as an expert in pathology and risk assessment?

MR. HISER: Actually, it was toxicology --

CHAIRMAN FESMIRE: Toxicology and risk assessment?

MR. BROOKS: No objection, Mr. Chairman.

MR. JANTZ: No objection.

MS. FOSTER: No objection.

CHAIRMAN FESMIRE: No objection being noted, we'll accept Dr. Thomas's credentials. He will be admitted as an expert in toxicology and risk assessment.

MR. HISER: Mr. Chairman, may I approach the witness?

CHAIRMAN FESMIRE: You may, sir.

DIRECT EXAMINATION (Resumed)

BY MR. HISER:

Q. Dr. Thomas, I'm placing in front of you an item which is labeled as industry committee Exhibit 7. Does that appear to be a statement of your résumé and curriculum vitae?

CHAIRMAN FESMIRE: Mr. Hiser, I don't think I got one. 7 is among the missing.

MR. HISER: Well, we -- Does anybody else have it, or --

COMMISSIONER OLSON: I've got it.

MR. HISER: -- is it missing for everybody?

We will try to make you an additional copy, Mr. Chairman, and give that to you. And Mr. Carr's volunteered his.

CHAIRMAN FESMIRE: Okay, thank you very much.

THE WITNESS: Exhibit 7 is my résumé.

Q. (By Mr. Hiser) And does that accurately reflect your résumé -- professional experience?

A. Yes, it does.

MR. HISER: We would move the admission of Exhibit 7.

CHAIRMAN FESMIRE: Is there any objection to the admission of Exhibit 7?

MR. BROOKS: No objection.

MR. JANTZ: No objection.

MS. FOSTER: No objection.

CHAIRMAN FESMIRE: Exhibit 7 will be admitted.

Q. (By Mr. Hiser) Now Dr. Thomas, behind that tab is Exhibit 8. And does Exhibit 8 reflect materials that you prepared for discussion with the Commission today?

A. It appears to.

Q. And are you prepared to discuss with the

Commission the proposed rule and some risk issues and other things that you've identified with this proposed rule?

A. I am.

Q. And do you have the PowerPoint as well which corresponds to this exhibit?

A. I do.

Q. Would you like to proceed?

A. All righty. Next slide, please.

What I thought I'd do today is talk about several different things.

I wanted to touch real briefly on risk and decision processes, especially how they relate to regulatory processes.

I want to talk about what's in the pits.

I want to talk about a risk evaluation of the constituents that were actually detected, both in the industry research program and the OCD's program.

I want to talk about how this relates to the OCD's proposed pit rule.

I want to talk about alternative impacts.

And then I've reached conclusions.

Q. Okay. And so when you're looking at a risk assessment process, why is that something that the Commission would be interested in doing?

A. Well, there are a number of reasons, and I've

listed in here as kind of evalu- -- the risk evaluation process.

First of all, in New Mexico the Oil and Gas Act requires that risk -- that is, protection of the environment and the public -- be considered in the regulatory process. And at least that protection, to me -- talks about risk, because without risk you're not protecting -- you don't need to protect.

The process of risk evaluation has a real value, I think, in the regulatory process, primarily because it's transparent, that it makes explicit exactly what the -- to all the parties involved exactly what the agency's objectives are in proposing a regulatory action.

It provides an understanding of the technical basis and the rationale for that proposed action, the proposed standards, and the regulatory requirements.

And it minimizes -- because of that transparency, it minimizes unnecessary expenditure of our very rare and scarce financial and technical resources, both industry and the agency's resources, due to unclear policy.

Q. And so if you're going to be starting and looking at this rule, does it make sense to understand what risks are the problem that appears to be being addressed by the rule?

A. Yeah, I honestly believe that the people of New

Mexico really must have a risk-based rule. Otherwise, I think all parties are kind of shooting in the dark in a lot of ways, and hopefully that will come -- become obvious in my presentation.

Q. Okay, and the rule that's being proposed by the Division is primarily aimed at addressing what particular aspect of the industry's operation at this time?

A. I'm sorry, I missed you --

Q. The rule -- the proposed pit rule really seems to be addressing what type of industry activity?

A. Well, the rule as I read -- obviously you've got more rules than just one, but the rule that I'm reading is dealing with temporary pits and in particular the ones that I'm calling drilling pits and recycle pits.

Q. Okay. And so if you're going to be looking at the risks that these present, would it make sense that you'd want to know what the materials and constituents are in the pit and whether they present some sort of health or environmental concern?

A. Absolutely.

Q. And did you undertake that type of evaluation?

A. I did.

Q. And what did you determine?

A. The next slide, please.

When we talk about what's in the drilling/reserve

pits, you know, we can take a look at how they're used and pretty well decide what type of materials go into it.

First of all, we've got formulated drilling muds. Okay? Most of the muds here are water-based, although I understand that it's possible to have some oil-based muds in these pits as well, but generally not a whole lock.

We get rocks and debris from the drilling operation itself as the drill bit cuts through various strata in subsurface.

We've got hydrocarbons as the drilling operation starts to encounter hydrocarbon pockets of crude oil or natural gas.

And we've got salts, either derived from the natural deposits or as part of the formulation of brine-based drilling fluids.

So those are essentially the constituents that should be in these drilling/reserve pits.

Next slide, please.

That leads us to some really critical questions with regard to all of us here.

First question is, Will any of the constituents contained in the closed drilling pit pose an unreasonable risk to the public health, environment or the natural resources of the State of New Mexico?

And if so, what is the most effective way to

mitigate that risk?

Next slide, please.

In order to answer some of that, the industry sponsored a sampling program.

Next slide.

Essentially that program consisted of a third party going out to the field, collecting samples of the contents of temporary pits after the fluids have been removed and just prior to closure.

The samples were analyzed for a full range of constituents, using standard EPA methods, and these analytes included metals, volatile compounds, semivolatile organic compounds, anions, cations, total petroleum hydrocarbon, polychlorinated biphenyls, radium isotopes and other analytes such as electrical conductivity and so on.

Where EPA methods allowed, a TCLP leachate of each sample was prepared and analyzed for selected metals and volatile organics.

Q. Now Dr. Thomas, in the second bullet point here you talk about that the samples were analyzed for a full range of constituents, and then you talk about a couple of different methods.

When you talk about a full range, what does that mean was done?

A. Well, each of the EPA methods is a standard

method procedure, and it will include a number of chemical constituents that are appropriately analyzed by that particular method.

So when we talk about a full method, therefore range of analytes, we're talking about the full range of analytes that were analyzed by that particular EPA method.

Q. And so are we talking about two or three different things that were analyzed in these methods, or tens, or what sort of magnitude?

A. No, we're talking over 100, perhaps even 200 different analytes.

Q. And then you also had -- or industry also did a TCLP leachate analysis. And why was that done?

A. The TCLP was conducted at my request, and the reason why is because there are a number of constituents such as barium sulfate, the barite that's used in drilling mud formulations, where -- you know, this is the same material that's given in barium enema, for example, and it's given because it's not water-soluble. And because it's not water-soluble it's not effectively absorbed into the body. Okay?

And we're starting to see the pattern over and over and over again, that in the old days the regulatory agencies would deal with metals as a total metal content, but these days what we're looking at is more the soluble

fraction of the metals. It's only the soluble ion that's actually able to be absorbed from the GI tract, for example, or from the lung, for example, to get into the body, to cause toxicity. Okay?

It's also the soluble parts of the metal that are actually environmentally mobile, so they're the only ones that would be able to transport through the soil column, impact groundwater, for example.

So as a result, I wanted some way to evaluate not just total metal content but also the soluble fraction as the bioavailable, environmentally mobile potentially toxic fraction of that metal.

The sampling program focused in two areas, the Permian Basin and also in the San Juan Basin.

As you already know, these two areas differ with regard to the type of production that is there. The northwest New Mexico or the San Juan Basin, is generally gas production, fairly shallow, 600 to 9000 feet.

The three pits in the southeast New Mexico, in Lea County, were -- in the Permian Basin, generally oil production is greater than 7000 feet, generally. So as a result of that, they will use different formations of mud, so they'll have different type of geology and so on.

The sampling program consisted of going to a total of six pits, three in the northwest, three in the

southeast. A total of 12 samples from each pit were collected by this third party. They were collected at depth -- they actually used an augur -- at 11 locations, and then collected one duplicate from each pit.

CHAIRMAN FESMIRE: Dr. Thomas --

THE WITNESS: Uh-huh.

CHAIRMAN FESMIRE: -- just as a preliminary thing, when was this done?

THE WITNESS: This was done probably a year ago.

CHAIRMAN FESMIRE: Was it prior to the task force?

MR. HISER: It was, in fact, done prior to the task force. It was -- they overlapped a little bit in time, and we actually were in the data evaluation phase, I think, when the task force was meeting. We hadn't actually got all the data in and validated it, and so that's why there was some delay initially in getting some of the information to the task force.

CHAIRMAN FESMIRE: Did the task force know about this sampling program?

MR. HISER: I was not a member of the task force, Mr. Chairman, nor did I attend any member -- meetings of the task force, so I don't know. Mr. Byrom or Mr. Newman or one of those people might know what all was provided. It's my understanding that a summary of this was provided

to the task force during its deliberation.

CHAIRMAN FESMIRE: Okay, so the samples weren't split with OCD, and OCD wasn't notified prior to the sampling?

MR. HISER: That is correct. This was done as an industry initiative. We were aware that you were thinking of a pit rule.

CHAIRMAN FESMIRE: I'm sorry, go ahead.

THE WITNESS: All right.

The samples were sent to an analytical laboratory, analyzed by the methods that were prescribed, and then the laboratory results were given.

When I took at look at the results I had some concerns with regard to quality assurance. We hired a third-party quality assurance auditor to evaluate the data. Once we were satisfied, we then started to evaluate the data with regard to interpretation.

My evaluations looked at all the constituents. If a constituent was at least detected or estimated in at least one of the 12 samples in the pit, that constituent was highlighted and was further evaluated.

So, what was found?

First of all, total petroleum hydrocarbons. Okay? TPH was evaluated by method 8015, which separates petroleum into a variety of different size-class of

hydrocarbons, in this case gasoline range organics and diesel range organic fractions.

Most of the hydrocarbons in both the northwest and the southeast pits were diesel range organic fractions. In the southeast the average TPH was 7700 milligrams per kilogram, in the northwest the average total TPH was 1800 milligram per kilogram.

OCD's proposed criterion is 2500 milligram per kilogram, so on the average you can see that in the southeast especially, we are exceeding that 2500 milligram per kilogram.

So the question is, is total TPH a risk issue? In other words, how good is that 2500 criterion? What does it really mean that you've got an average concentration at 7700 ppm?

Next slide.

Chloride was also found, of course. The average concentration of chloride anion was found to be 126,000 in the southeast, 3900 in the northwest. And again the question is, does chloride ion at these levels pose a risk?

Next slide.

Arsenic. Now arsenic is not a component of commercial drilling muds, so its presence is likely to be due to natural subsurface minerals being brought up during the drilling process.

The average in the northwest was 4.1 milligrams per kilogram, the average in the southeast was 2.3. Looking at the Environmental Department's tier 1 residential soil screening level, it is 3.9. So we've got a slight exceedence up there in the northwest.

We looked at that TCLP, looking at what part of that arsenic is actually soluble, and we found that it was nondetectable in all the different TCLP leachates that were looked at. That indicates that the natural arsenic-containing minerals are not soluble in water, they are not environmentally mobile and therefore not bioavailable. That is, they are not toxic.

Okay, that's not surprising. As you can imagine, in the environment most minerals, when you find deposits of minerals, are not soluble, which is why they're crystallized into a deposit. Otherwise, they would have been taken away by the rainwater long ago, by the percolating rainwater.

Next slide.

We found barium. Again, not a surprise, because barium is -- in the form of barium sulfate, is a common component of drilling fluids.

In the southeast the level was 1763 parts per million, in the northwest we had 10,000 parts per million. The Environmental Department's soil screening level is

5400.

So barium levels in the TCLP leachates were low, estimated to be -- that's the soluble barium ion -- less than 3 percent of total. Actually it was, I think, 2.7 or less. In many cases, nondetect. And they were less than the Water Quality Control Commission's 3103 criterion.

Low water solubility indicates that barium in the pits is not environmentally mobile and not bioavailable.

So -- Next slide.

We also found benzene. Now benzene is a natural constituent of petroleum and natural gas, and it's not considered to be a component of water-based drilling mud formulations. It's a recognized human carcinogen, causing a particular type of leukemia.

The average in the southeast was 8.17 parts per million, the average in the northwest was .12 parts per million. The Environmental Department's soil screening level is 10.3 parts per million. So it may or may not be a criterion, based on average.

All the soil samples exhibiting benzene concentrations above the SSL, Environmental Department's soil screening level, were from a single pit there in the southeast part of New Mexico, and all of these samples were diluted a thousandfold.

Other samples of it from the same -- or other

analyses from the same sample were diluted something like five- to a hundredfold. But the benzene samples actually were diluted a thousandfold.

When you've got high dilution ratios like that, any kind of variability in the analytical method will be magnified by that dilution factor. So it really complicates the interpretation of the benzene data, but in -- not only because it's from a single pit, but also because of that dilution factor. So it's not clear to me that benzene really is an issue here.

Next slide, please.

We also found some halogenated compounds that I was just totally stumped by, because these are not commonly used in solvents, they're not commonly -- and eventually it turned out that -- with discussion with the laboratory, that they actually add these compounds to these samples as surrogates so they can take a look at how much or how affected their analytical recoveries are in the laboratory. So these actually were added, and they're not really part of the drilling mud.

Next slide.

Q. (By Mr. Hiser) So this was a laboratory -- this was a laboratory addition and not actually found in the samples taken from the pits?

A. That's correct, and they were purposely added by

the laboratory.

Q. Okay.

A. Okay? There are other compounds, as I mentioned. These methods have a variety of compounds for which they're approved. All those were looked at, so there were other types of metals, other VOCs, SVOCs, PCBs and so on.

And when I started to look at the levels, they were all below the Environmental Department's soil screening levels or other levels from other agencies that -- when I couldn't find a New Mexico-based criterion.

The average leachate concentrations -- that is, soluble materials in the TCLP leachate -- were below the available 3103 criteria or drinking water surrogate criteria. Again, if there's no New Mexico-based number, I looked for appropriate surrogates.

So the other compounds do not seem to propose a significant risk to public health or the environment.

Q. So the drinking water surrogates, you were looking at things like maximum contaminant levels or maximum contaminant level goals or --

A. That's right --

Q. -- something of that --

A. -- that's an EPA criterion for drinking water.

Q. Did you look at the OCD sampling program as well?

A. I did. OCD, of course, had their own sampling

program, but -- there wasn't a lot of detail available to us to know exactly how it was conducted, but it appears to me that they collected samples from the corners of each pit, and they mixed them to form a composite, that is --

CHAIRMAN FESMIRE: Okay, Dr. Thomas, you said -- Can we go back to the statement that you just made, It wasn't clear to me -- what?

THE WITNESS: There wasn't a formal work plan that was given to us, or given to me, by OCD staff. That is, it didn't say that the laboratory -- that the field people will go out and they will collect the sample in this manner, from this location, at this depth, with this equipment. The washing of the equipment is all specified in those kinds of plans, the health and safety criteria are all specified in those kinds of plans. Well, that kind of detail was not available here.

CHAIRMAN FESMIRE: Are you saying it wasn't available to you, or it wasn't available to anyone?

THE WITNESS: Well, I'm sure they have it, because they went out and collected samples, but it wasn't available to me.

CHAIRMAN FESMIRE: And are you aware that there was an industry representative on site, every sample that was collected?

THE WITNESS: I am.

CHAIRMAN FESMIRE: Okay, so --

THE WITNESS: I am, and I have their notes. I have their notes of how the samples were collected and so on.

CHAIRMAN FESMIRE: Do you have the pictures that they took and the --

THE WITNESS: I have the pictures that they took as well, yeah.

CHAIRMAN FESMIRE: Okay, but that wasn't done on the industry case, was it?

THE WITNESS: I'm sorry?

CHAIRMAN FESMIRE: That wasn't done when the industry collected their samples, was it?

THE WITNESS: What?

CHAIRMAN FESMIRE: That kind of oversight wasn't -- wasn't done by OCD when the industry collected their samples?

THE WITNESS: I don't know, I wasn't out in the field to monitor that. I -- but my understanding is, no, it wasn't, that they were collecting samples for their own internal research, and -- but they did have a complete sampling plan developed for that purpose. And like I said, they had -- a third party actually collected, following their specified plan.

CHAIRMAN FESMIRE: Go ahead and continue.

THE WITNESS: So in any case it appears to me that what OCD staff did is that they went onto the surface of these pits, or close to the corners of the pits, collected samples, and then mixed the four collected samples to make a composite, and that that was then sent to the laboratory for the analysis.

OCD also collected water samples, which to me suggests that the fluids had not yet been removed from these pits, and so these were not yet that close to closure. I don't have more detail than that from the sampling program.

The OCD tests essentially were parallel to what the industry's test program were.

Next slide, please.

In the OCD sampling program in the southeast pits, of 20 detected analytes having soil screening levels from the Environment Department, only arsenic exceeded its NMED criterion. As I mentioned before, arsenic is probably from subsurface formations and mineral deposits, and it's not water-soluble, and that should be expected here as well.

In the northwest, of 23 detected analytes having SSLs, none exceeded the NMED criterion.

Next slide.

Q. (By Mr. Hiser) So then based on looking at both

the industry and the OCD studies, what did you conclude in terms of constituents that were -- that potentially have a health or environmental concern?

A. Well, just from the analytical data, there were three types of analyses where I thought there may be possible regulatory concern. They were total petroleum hydrocarbon, chloride and benzene.

And so my next step was to try to evaluate just how much of an issue they are, so as I think about, from a risk perspective, total petroleum hydrocarbons.

Next slide.

OCD has suggested use of EPA method 418.1 as a simple and inexpensive test for TPH, and that's an old, old method, but it's no longer part of the EPA method series. And the reason why is because it used freon, and freon has been banned in the United States. And so essentially the laboratories said -- that still say they run 418.1 either are breaking the law by using freon, or they are not quite honest in telling us what alternative extraction solvent they're using in order to achieve that analytical method. Okay?

Solvent extraction itself is fairly nonspecific. That is, not only are you able to extract petroleum hydrocarbons, but you can extract fatty acids and waxes from things like plant leaves and other types of biological

material. And so any time you've got a simple extraction procedure, you need to be careful. You're calling it total petroleum hydrocarbon, but it is quite possible and in some cases has been shown that the -- even though petroleum is not there, you get a TPH reading due to leaf wax and fatty acids from other types of materials.

My recommendation is, if TPH is an issue to OCD, that they probably ought to consider, rather than 418.1, they should use something like the 8015M method or the EPA method for oil and grease.

I looked at the criterion that OCD has proposed, and I can only assume that they got it from NMED. NMED has developed a risk-based soil screening level of 2500 milligram per kilogram for waste oil, and that's based upon an assumption of the size-class of hydrocarbons that comprise waste oil. And they're assuming also that there is a health risk to a hypothetical resident who directly contacts that waste oil.

And so on that basis NMED proposed 2500 parts per million.

It appears to me that OCD has simply adopted the waste oil criterion from NMED. Okay?

So the question is, has OCD considered whether the waste oil SSL is appropriate for petroleum crude oil and natural gas hydrocarbons. Okay?

As I mentioned, the oil -- or they hydrocarbons that we're seeing from the analytical program done by the industry are primarily gasoline range organics -- I'm sorry, diesel range organics, not gasoline range organics. Okay? But they don't go over into lubricant range organics, necessarily.

TPH standard has not -- specifically stated -- OCD has not specifically stated the nature of their concern about TPH. As I look at it, I can't really tell whether the concern is a health-based concern like cancer or immunosuppression or something like that, or whether it's something as simple as, if it gets in the water it tastes bad. Okay? At this stage I can't tell.

What that means is that OCD has really not given the members of the Commission the technical information that I think you need to judge whether the OCD-proposed regulation is first of all appropriate.

And, two, if anybody ever comes to you for an exemption or an exception or something like that, you also may not have adequate information to say, This is the concern we're trying to address, and your exemption is denied because it doesn't deal with that. Or it does deal with that, and your exemption is denied anyway, whatever.

But in other words, you don't really have, I think, good information to work on, to make a decision with

regard to TPH.

Next slide, please.

As I look at the TPH standard and from a risk-assessment point of view, you know, a couple of things become obvious.

One is, OCD has not given a technical rationale for their proposed 2500-milligram-per-kilogram standard. It's not clear why NMED's number is applicable to the pit materials. If OCD's 2500-milligram-per-kilogram criterion is safe and a party is able to reach that, it's not clear to me why the current closure-in-place practice is inappropriate, why you have to dig it up and haul it away.

A better rationale would look at the risks presented by different pathways of exposure. For example in the future, somebody building a house over one of these pits and then children and then adults having direct contact to contaminated soil, in this case pit solids.

As I take a look at that I keep finding that this is going to be constructed with a four-foot cover, it's going to have construction and residential as the primary exposure scenarios -- I think that should be "are" primary exposure scenarios.

The other type of exposure I can see is groundwater, where the hydrocarbons leach. But these hydrocarbons, especially in the diesel range, have low

solubility, their volatilization and biodegradation are issues that will continue to reduce their levels in the soil, as will -- I'm sorry.

The other thing to keep in mind is that total petroleum hydrocarbons includes a number of things for which there is legitimate concern, but TPH is a pretty crude measure.

And better measures from evaluating the risk and the health, the environmental concerns, would be things like BTEX -- benzene, toluene, ethylbenzene and xylene -- for the gasoline range fraction, and polycyclic aromatic hydrocarbons for the diesel range organic fraction. TPH doesn't tell you very much, whereas these become more specific with regard to concentrations of constituents of concern and the types of adverse effects that could be expected from those constituents.

So my viewpoint is that it's always better to regulate a specific toxicant, rather than a nebulous mixture like TPH.

Of the BTEX and PAHs that we looked at individually in the analytical programs, the data indicate that only benzene -- and that's only a possibility, only benzene is of possible regulatory concern.

So the question I have is, why are we regulating TPH? Why is that an important metric for us to base all of

our regulation and decisions on.

Could I have the next slide, please?

From the perspective of chloride --

Next slide.

-- chloride anion is a highly water-soluble specie. It's been used historically as a way to trace essentially the migration of water in the environment, because where water goes chloride is right with it. The proposed rule does not state the nature of OCD's concern with regard to chloride, although it appears from the wording and their suggested approaches that they're talking about protection of groundwater as the primary goal. Okay?

While salt -- that is, sodium chloride -- can be toxic to plants, it's not the chloride anion that's the primary part that's responsible. Rather it's sodium, which surrounds itself with a large shell of water molecules. Okay? And therefore it competes with plant roots for that water. When the plant roots don't win, they dehydrate and start to die. Okay?

We see similar mechanisms in people who consume large amounts of salt, where you start to get -- or are exposed to large amounts of salt, where the sodium will pull the water out of the tissue and disrupt biological functions in that manner. The Egyptians used salt, as you know, as part of their embalming process, in order to pull

the water out of the tissue and therefore prevent further degradation.

Chloride, I think, is a very poor predictor of the risks associated with sodium chloride. I think the more direct measures of sodium or perhaps one of its surrogate metrics, like electrical conductivity or SAR or whatever other type of measure, may be more appropriate ways to evaluate the risks that we're really concerned about, and that's due to sodium, not to chloride.

Next slide, please.

Again, from the risk-analysis point of view, risk occurs when you have a potential for exposure.

And in this particular case, this particular -- the pathway is direct exposure. That is, direct contact with contaminated soils or groundwater, we see here, is primarily salt-driven.

But again from the ingestion point of view with solids, we haven't seen direct contact because we've got that four foot of cover and a top barrier, membrane, that is good warning that there's good warning that there's something here that we shouldn't be touching, or need to deal with and study.

If chloride is of concern, in terms of recommended level, okay, again, the direct exposures are addressed by the cover. Groundwater should be based on

protection of groundwater use. Therefore a leachable standard of 3500 milligrams per liter, I believe, is protective. And that number came from Daniel B. Stephens and his models of migration through the soil column.

A non-leachable field test may be -- may simplify field administration of the standard, but measurement of sodium is a better metric for risk evaluation than is chloride.

With regard to benzene, benzene may or may not be an issue, as I've discussed. I mentioned that the analytical results were highly diluted, and it all comes from one pit.

Benzene has a short half-life. It is volatile, and therefore during the evaporation of fluids and the mixing of the soils, benzene will tend to volatilize into the atmosphere.

So as we take a look at the pathways of potential concern, the direct contact, the residential contact, is minimized again by that four-foot cover and the geotechnical liner.

Groundwater use? Hm. Well, you've got a long way to groundwater, and -- I think that's maybe on the next slide. Yeah, here we are.

The direct contact is limited to construction or other physical disturbances, or the -- and as I mentioned,

because benzene is volatile, it will tend to disappear from the waste material.

Groundwater is generally distant, according to the rules, and therefore the migration -- the downward migration of benzene will tend to facilitate its biodegradation and/or loss by evapotranspiration.

We normally think of evapotranspiration being a water process, but anything that's volatile will evaporate and potentially transpire through the plants.

So if I had to give you a recommendation, I think the tier 1 screening level for benzene in soil to minimize risk to a construction worker is 174 milligrams per kilogram. Okay? I don't think that there's really going to be significant exposure to a resident from this particular situation, so I'm recommending that a more reasonable screening level would be the 174 milligrams for a construction worker, as proposed by NMED.

Next slide, please.

The OCD has given a whole table of 3103 analytes, and these are proposed by the Water Quality -- Control Commission? WQCC? And I don't know if anybody has looked at the levels, but talking with the WQCC staff, they don't really recall where these numbers came from.

And comparing it to current water criteria, some of the numbers are higher than, say, EPA criteria, some of

them are more stringent than EPA criteria. But it's the ones that are higher that are of more concern, because as you know, states are not supposed to have criteria that are less stringent than the federal government.

The 3103 constituents contain -- or the list contains a number of chemicals that are not expected in any way in these pits. But I assume that they have to be analyzed anyway.

As I take a look at the pathways of potential concern, again, direct contact. But again, these are under a four-foot cover and a geotechnical liner.

Groundwater use. I don't see that the levels that we saw in our analytical programs, you know, really are going to exceed drinking water standards at this time.

Next slide, please.

I keep getting ahead of myself, but essentially my conclusion, after looking at the data, is that the 3103 constituents, by these routes of exposure, provide *de minimis* risk to health or the environment. So I'm not quite sure why 3103 criteria are really so of concern here to OCD.

Next slide, please.

Next slide.

OCD's pit rule, as I read it, proposes standards for the situations where you're treating the waste or

there's a possibility of release from the waste pit.

The existing industry data would suggest that pits will not meet the standards. Particularly the 3013 criteria, I see, will have some impact.

In essence, all the drilling materials will have to be hauled off and disposed of at a commercial OCD-approved landfill.

I understand that you've had further discussion since I was last here, but that was how I was reading it when I was putting these slides together.

Next slide, please.

Next slide.

You know, we heard Mr. Pease talk this morning about consequences, or economic consequences, and so on. And you know, I think from the regulatory risk point of view it's always important for everybody to understand that any decision that you make, no matter how simple, will have consequences. Some of the consequences will be beneficial, some of the consequences will be adverse.

The OCD rule addresses direct exposure risk, groundwater risk, and it does it in such a way that it says the waste material is going to be dug up and hauled away, so it's by removing the pit contents.

The industry-sponsored study, as reported by Mr. Pease -- Pease? -- this morning, that talked about the

likely consequences of, you know, as a result of transport and disposal of pit materials. Okay? There were economic impact, there were vehicular accidents, injuries and facilities, and there were environmental consequences that were addressed in that particular evaluation. Okay?

Next slide.

The economic impacts you heard, okay? At the time he was estimating there were more than $50 million a year compliance costs would be added to operations in New Mexico.

It was estimated that the industry will drill approximately 1400 wells per year in the state, that -- it noted that there are only four OCD-approved landfills in New Mexico, and all of those are in the southeast part of the state. Therefore new landfill capacity would have to be developed if they're going to be OCD-approved.

Noted that there would be an increase in truck traffic. Okay? And whether it's 400 miles or 100 miles, there will be deterioration and repair of New Mexico roads that will have to be borne.

Next slide.

In terms of vehicular accidents, it said that as long as you've got traffic moving as a result of your regulations, there will be accidents. And as a result of the accidents there will be physical damage that will be

realized.

There will be injuries, and there will be fatalities. Okay? I'm not sure that we can predict with any certainty what the level is, based on what I heard this morning, but it doesn't really matter. At some point you have to realize that whatever you propose will have consequences. And if you're going to have anything hauled and dug -- dug up and hauled away, you're going to have road traffic that will result in fatalities and injuries and physical damage to vehicles and so on.

Next slide, please.

The environmental consequences are also some of the things that the industry evaluated, and there will be an increase in dust, there will be an increase in vehicular emissions of various types of hydrocarbons and so on.

Again, the estimates can go up and down, but the point is that we will have adverse consequences.

One of the things that I thought was interesting is that the Governor apparently has a greenhouse gas emission reduction goal in northwest New Mexico, and that the increased $CO_2$ emissions are projected to perhaps put that into jeopardy, so it'll be interesting to see.

So in conclusion, what is the risk?

As I look at it, there are only a few of the constituents that are found in drilling recycling pits that

may be of regulatory concern. In particular, TPH, chloride and benzene were the things that came up in the analytical program.

Now these constituents pose little risk to public health and also little risk to the environment by the expected pathways of exposure. Okay?

And based on OCD's proposed language, it appears that OCD is primarily concerned with odor and taste impacts on groundwater. That is, I don't see a health basis for TPH. Okay? Again, only benzene was there. I don't see a health basis for the benzene, and that may be an analytical artifact anyway. Okay?

And I don't see a health basis for sodium chloride -- that is, the salt in the water -- except as it affects the taste of water.

So as I look at it I'm again stymied as to what we're doing and why we're doing it to the degree we're doing it for the types of risk that these materials are posing.

So based on OCD's -- I'm sorry, for evaluating risk -- okay? -- I believe that BTEX and PAHs are better metrics for -- than TPH for evaluating health effects. Okay?

Sodium, I believe, is a better metric than chloride. Okay?

So does the proposed pit rule actually reduce risk? Well, actually I don't think so. Of all the things here, it's the sodium chloride that I'm most concerned with.

What essentially the OCD rule does is, it takes small pits -- that is, closed in place -- and combines them into a large OCD-approved pit -- okay? -- which essentially now puts all of the mass of things like sodium chloride into a large container. Okay? And I am suspicious enough of any kind of geotechnical membrane to think that it's going to last forever.

So at some point the membranes will fail, and at some point OCD and the Commission are going to have to evaluate and do something about, now, catastrophic leaks of large masses of sodium chloride, rather than individual small masses of sodium chloride dispersed and spread out through the state.

Next slide, please.

So I looked at OCD making proposals that will have impacts. Okay? I don't know the exact numbers, but we will have impacts on the number of lives lost, we'll have increases in number of injuries, we'll have increases in emissions, of greenhouse gases, for example, airborne dust, for example. We'll see groundwater impacted at some point in the future. Okay? And we have increases in

dollars, both in drilling and compliance costs as well as the state repair of roads and so on. And we'll have an impact, possibly, on state revenue. Okay?

So if those are the adverse costs, what are the benefits that we've actually gained?

One is, we've got a speculative decrease in direct exposure. Again, these materials are buried under four feet with a geotechnical membrane that provides some warning that you've got material underneath that needs to be concerned with.

We've got fewer pits with groundwater impacts, but we've concentrated them at these landfill sites.

Next slide.

When I take a look at the industry's counterproposal, they provide similar benefits but they provide them at much less cost. Okay?

Small on-site pit closures -- that is, small masses of toxicants -- present less overall risk to groundwater than large concentrated landfills with large masses of toxicant.

If the liners do not fail, then both the off-site [*sic*] closure and the landfills are equally protective.

If the liners do fail, then the offsite -- on-site pit closures are more protective, I think, than landfills.

Direct exposure risks -- that is, residential and construction -- I see are *de minimis* for the materials that we've got here.

Other cumulative impacts are minimized. That is, lives, injuries and emissions.

So as I look at the proposed industry approach I think it has a lot of merit.

Next slide, please.

So both the OCD and the industry approaches achieve similar results, but industry's approach achieves the same result at a lower cost. And I think that there's something that needs to be thought through here.

In particular, it seems to me that OCD is not making a risk judgment. I don't see risk -- or risk thinking in any of the documents that I'm seeing with regard to OCD. What I think they're doing, really, is making a value judgment, that the mere presence of a waste justifies digging it up, hauling it away and all the other things that are in the proposed rule. Okay? That is, stated another way, that the OCD approach that the mere presence of waste justifies the additional loss of life, injury and economic effects.

I think that the State of New Mexico, the people of New Mexico, really deserve a better, considered rule. And I'm hoping that you as Commissioners will make that

appropriate judgment.

Q. And so, Dr. Thomas, as a toxicologist and as a risk assessor who's familiar with the oil and gas industry, is it your professional opinion that as the materials would be disposed of in the industry proposal, that there would be only *de minimis* risk to human health?

A. Yes, yes.

Q. And that there would be --

A. But that's to human health, let's make that clear. I am concerned about salt impact on groundwater.

Q. Okay. And then the industry -- on that aspect, you looked at Daniel Stephens' work showing the -- at 3500, showing that that would preserve the Water Quality Control Commission standards?

A. Yes, I did.

Q. And assuming that the Water Quality Control standard is an appropriate standard, would that seem, then, to be a reasonable level to address the policy established by the Water Quality Control Commission?

A. I believe so.

MR. HISER: Mr. Chairman, we would move the entry of Exhibit 8, which is the slides from Dr. Thomas, and also then Exhibit 9, which is his report which provides a little bit more detail, and the references that support his testimony.

CHAIRMAN FESMIRE: Have you laid --

Maybe I should ask two questions before you --

Q. (By Mr. Hiser) Dr. Thomas, Exhibit 8 is the presentation that you just went through; is that correct?

A. It does.

Q. And Exhibit 9 is the report that you authored?

A. Yes.

Q. And it accurately sets forth your views on this matter?

A. Yes, it does.

Q. And it's been prepared in accordance with the standard practices of toxicologists and risk assessors?

A. It has.

MR. HISER: I would move the admission of Exhibits 8 and 9.

CHAIRMAN FESMIRE: And 9 incorporates some of the work of -- What we've got here is 10, right?

MR. HISER: That is, but it's just an exhibit that's already in evidence, so I'm not moving it again. But he did look at the report by Daniel B. Stephens and Associates as part of his work.

COMMISSIONER OLSON: Exhibit 9 largely looks like -- a lot of it largely looks like what's in --

MR. HISER: Exhibit 9 is in large part the same, but it also includes a number of additional references, and

there's some additional textual material that provides clarifications on a number of points.

CHAIRMAN FESMIRE: What is Exhibit A? Is that the analysis of the industry sampling?

MR. HISER: Let me retrieve my copy of --

MS. FOSTER: Mr. Chairman, also, just so the record is clear, in this instance when we're talking about industry, it's the industry committee, not the entirety of industry, because --

(Laughter)

CHAIRMAN FESMIRE: Yeah, let's make sure the record indicates the difference.

MS. FOSTER: Thank you.

CHAIRMAN FESMIRE: What is Exhibit A?

MR. HISER: Exhibit --

CHAIRMAN FESMIRE: I mean, attachment A to Exhibit 9?

MR. HISER: Attachment A to Exhibit 9 is materials that reflect the report that Dr. Thomas spoke about.

CHAIRMAN FESMIRE: What report is that?

MR. HISER: This is the -- I believe this is a summary report, the outgrowth from the industry committee's sampling program.

CHAIRMAN FESMIRE: Can we get the raw data?

MR. HISER: I think we've -- I don't have the raw data with me, and -- I can certainly see if it's available.

CHAIRMAN FESMIRE: Is there any objection to the admission of Exhibit 8, the slides?

MR. BROOKS: No objection, Mr. Chairman.

MR. JANTZ: No objection, Mr. Chairman.

MS. FOSTER: No objection, Mr. Chairman.

CHAIRMAN FESMIRE: Seeing no exhib- -- objection, Exhibit 8 will be admitted into the record.

Exhibit 9, I would like a clarification and the addition of the raw data if it's available.

MR. HISER: Yes, we do have the raw data available so we --

CHAIRMAN FESMIRE: Okay --

MR. HISER: -- can provide that.

CHAIRMAN FESMIRE: -- we'd like to see the raw data. Can we get it -- We're going to break for lunch here in a minute. Can we get it after lunch.

MR. HISER: Do you have it with you electronically, Ben?

THE WITNESS: I think I do.

MR. HISER: If we have it electronically we'll provide it after lunch, and if we don't have it electronically here we'll see if we can get it e-mailed so it will be available -- well, we could drop it by the

Commission tomorrow.

CHAIRMAN FESMIRE: Okay. So at this point we won't admit Exhibit 9, and we'll reconsider it after we get the raw data.

MR. HISER: If that's the Commission's pleasure for the moment, we'll be happy to provide the data.

CHAIRMAN FESMIRE: Thank you.

You have no further questions of this witness on direct?

MR. HISER: Not on direct, no.

CHAIRMAN FESMIRE: Okay.

MR. HISER: I guess the question is, do you want us to try to cover any rebuttal testimony from Dr. Thomas, or what would your preference be? I have probably 15 minutes or less of rebuttal testimony from Dr. Thomas.

CHAIRMAN FESMIRE: Why don't we cover that immediately after -- after lunch.

MR. HISER: Okay.

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

MR. DUGAN: I'm Tom Dugan.

CHAIRMAN FESMIRE: Okay, why don't you come forward, Mr. Dugan?

Mr. Dugan, we have two ways of doing this. You can either give a statement of position, or you can be

sworn and give a -- give testimony. Sworn testimony subjects you to cross-examination by the attorneys.

MR. DUGAN: Okay, we --

CHAIRMAN FESMIRE: Do you have a preference?

MR. DUGAN: We'll -- whatever. Sworn is fine.

CHAIRMAN FESMIRE: Okay. Is there going to be a duet? We've already had a couple of them.

MR. DUGAN: Sir?

CHAIRMAN FESMIRE: Are you both going to do it at the same time?

MR. ROE: Tom will --

MR. DUGAN: I'll make a statement, and then he will.

CHAIRMAN FESMIRE: Okay, why don't you raise your right hand and be sworn, please.

(Thereupon, the witness was sworn.)

TOM DUGAN,

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

DIRECT TESTIMONY

BY MR. DUGAN:

MR. DUGAN: I'm Tom Dugan, I'm the president of Dugan Production.

And I moved to New Mexico in 1952 with Phillips Petroleum, and Phillips turned their properties over to

Pacific Northwest Pipeline Corporation in '55, and I went to work for Pacific Northwest Pipeline Corporation. And I worked for Val Reese and Associates for a short time, and I went into business for myself in 1959. And I'm a petroleum engineer, a graduate of the University of Oklahoma in 1950.

We operate around -- a little over 800 wells, and our current production is close to 25 million a day and about 325 barrels of oil a day.

We are ranked 23rd in your list of producers for gas, and 60 in oil.

We've drilled -- we drilled 47 wells last year, we drilled 41 wells so far this year, and we currently have two rigs working.

We paid $4.19 million to the State of New Mexico, million dollars, to the State of New Mexico for production taxes, we paid $1.3 million to the State of New Mexico for royalties. We paid quite a lot more than that to the federal government, which New Mexico shares in.

We currently have 155 employees, and we have five workover rigs, five water trucks and five roustabout groups.

We don't agree with the proposed new pit rule. We've spent an awful lot of time working on Rule Number 50 and trying to get in compliance with it, and that was a very short time ago. We see no evidence for change from

the current rule.

The drilling mud and cuttings does not seem to be harmful to anybody that I know, and I've worked around it for over 55 years.

Last month I was up in Canada and found out that up there the operators have a choice of burying the drilling cuttings on site, or they are also spread out on the farmers' fields because the farmers like it, and they -- and they get an increase in their production when they do spread it out on the fields. And they also have a choice of sending it to a land- --

It appears that we're trying to make this a hazardous waste, and it's not. And you know, if this rule goes into effect we'll have to shut down, at least until we -- shut down our drilling until we figure out how best to handle it.

I don't think the closed loops -- Most of the wells we drill are shallow coal wells, coalbed methane wells. They're from -- anywhere from 350 feet to 2000 feet deep.

We -- You know, the waste from them is very small. I don't think the closed-loop system is going to work on these small rigs that we use to drill these shallow wells. I'm sure it can be adapted somehow, but it -- I don't think it'll be very practical to try to make it work

on these -- the small rigs that we work with.

I guess that's about all I have to say right now, that we think that the rule -- current Rule 50 is adequate.

CHAIRMAN FESMIRE: Thank you, Mr. Dugan.

Are there any questions of this witness?

MR. HISER: No, Mr. Chairman.

MR. BROOKS: No questions.

MR. JANTZ: No questions, Mr. Chairman.

CHAIRMAN FESMIRE: Thank you very much, Mr. Dugan.

MR. DUGAN: Thank you.

CHAIRMAN FESMIRE: Having seen it once, you can raise your right hand. Do you know what your choices are?

(Thereupon, the witness was sworn.)

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

JOHN ROE,

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

DIRECT TESTIMONY

BY MR. ROE:

MR. ROE: Okay, I'm John Roe. I work for Dugan Production as the engineering manager in Farmington, New Mexico.

And we're here today, as Mr. Dugan has already

told you, to voice a concern over the impact that we as a small oil and gas producer will experience upon trying to comply with Rule 50 -- or the repeal of Rule 50 and the implementation of the current rules regarding pits and -- drilling and production pits.

I have some extra copies. Dugan Production prepared a letter and written comments and did provide those timely to the OCD.

CHAIRMAN FESMIRE: Mr. Roe, those are -- if it's the same letter that I received --

THE WITNESS: It is.

CHAIRMAN FESMIRE: -- it's part of the record.

THE WITNESS: It is. And I brought extra copies in case there was any question or anybody wanted -- But that letter is what we submitted in verbatim, it's...

One of the things that Dugan Production -- I'm not going to say specializes in, but we -- a large part of our wells are marginal wells, low-rate wells. They're wells that other operators have decided were uneconomical. And because, as Mr. Dugan said, we have our own pulling units, we have our own roustabout crews, we have our own water trucks, we pretty much try to cut our expenses and operate these wells as economically as we can.

And so we have a lot of what are typically referred to as stripper wells or low-rate wells, marginal

wells. And a lot of our wells will feel the negative economic impact if we basically have to do much more in the form of putting tanks -- if for some reason we're not allowed to continue using unlined earthen pits as a disposal method for the small amount of produced water.

I set out in the letter that I referenced, we -- basically, right after Rule 50 was first implemented in 2004, we made a pretty significant work effort to get our wells compliant with Rule 50 as it currently exists.

We spent -- since that rule, we've spent around $1.5 million closing pits.

We did submit applications for registration of 242 earthen pits, 77 below-grade tanks. And all of these we're operating -- well, of the 242 earthen pits, we currently have 128 of those are active, that -- there's -- of the 128, we have 78 oil wells and 50 gas wells that currently are registered under Rule 50.

The analysis and application that was done for registration, each of those pits, pretty much documents that groundwater is either nonexistent or it's at a depth that is very little concern, as far as contamination as a result of putting a small amount of produced water in these pits.

To -- The average oil production for the 78 wells that are using unlined pits is less than a barrel a day; .9

is the average you would get. And these -- because they're oil wells, they don't produce much gas on the average. There would be around 7 or 8 MCF a day produced. About half of that would be used on-lease for fuel, leaving, you know, 2 or 3 MCF a day that we're selling.

So it's pretty clear, the economics of operating these wells is truly marginal. We're able to do so because of the way Mr. Dugan has put Dugan Production together and we operate. We -- Even though on an average basis they don't produce much, on a composite basis they do produce.

These 128 wells that are currently using unlined earthen pits for disposal of less than 5 barrels a day, in fact, the average barrels of water per day that we're disposing is .6 barrels of water per day. And again, the current rules under consideration, we would no longer be able to continue to do this.

These 128 wells, during -- on an annual basis we pay around $216,000 royalty. Not all of that is to the state. This is a lot of fed- -- this is all types of royalty. But that -- wherever that royalty goes, we're pretty sure that that would be lost, simply because we would no longer be able to continue to operate these wells.

In addition to the $216,000 a year royalty that we pay on this production, we pay around $130,000 of production tax, so -- and the State of New Mexico would be

the recipient of that production tax.

And again, it's my anticipation that if we have to do anything at all, other than continue operations on these wells, we probably will lose this revenue.

And so at any rate, in addition to Dugan Production having stripper wells, the State of New Mexico has tremendous -- or a large number of stripper wells.

Using some data published by the Independent Petroleum Association of America, there is currently around 13,000 stripper oil wells in the State of New Mexico and around 9200 stripper gas wells. And these stripper wells, I am going to guess, will experience the same impact as the 128 wells that Dugan Production operates.

And my -- just a calculation of using average oil prices and average gas prices during 19- -- or 2006, that will result in a loss of royalty of around $163 million, and around $98 million in production taxes. And again, that's applying -- making an estimate of the production that would be associated with stripper oil and gas wells within the State of New Mexico, and predicting that that revenue will be lost if these wells are forced to change the method of operation in any manner.

And again, Dugan's wells are, for the most part, in a part of the Basin that groundwater is not an issue. It's either not there or it's deeper than 100 feet.

So we feel that particularly the marginal wells are going to take a direct hit, probably any future reserves will be lost forever. And I say forever because who in their right mind would redrill that lease to develop reserves we couldn't justify producing now?

One of the things that I guess it's difficult for us to understand, why the current Rule 50 is not meeting a need that exists for governing how we use production pits and drilling reserve pits.

We're personally -- we're unaware of any environmental impact that results from drilling pits, particularly in northwest New Mexico. We are aware there's a couple of groundwater contaminations that have occurred. We aren't aware -- As Mr. Dugan pointed out, we've been in operations for nearly 50 years, and I'm unaware that we've had any groundwater contamination associated with one of our wells.

I keep hearing -- and it keeps being referred to, that there is a database in OCD records that has -- I've heard numbers, 600, 800 records of groundwater impacts. I went to that data set in the OCD records and spent some time looking at that data set, and I don't think that that data set should be used as justification for changing Rule 50.

The data set, it looks to me -- I, again, have

spent some time. There's 748 lines of data in that 35-pages of the file. Of those 748 lines of data, again, there's not a lot of information in that file to know exactly what each groundwater impact is -- represents. But there is enough information that it looks to me like there's 479 of that 748 sites that are something other than contaminations resulting from a production pit or a drilling pit.

And so 74 percent of the data is, you know, not associate with drilling/production pits, yet that data file keeps being used as a reason to -- we need changes.

Of those 479 lines that I'm personally thinking have nothing to do with drilling and production pits, 284 of them are groundwater impacts that were recorded by pipeline companies.

And again, the data set doesn't lend itself to know exactly. I suppose I could spend the time and figure out what each groundwater -- or each remediation report -- why it was submitted.

But it looked to me like a lot of them probably were knowing that some of the pits -- well, natural gas pipeline companies were the bulk of that 284 instances, and having had some dealings with that, that's typically remediations of dehydrator pits that are no longer even an issue.

If an operator does have a dehydrator, typically any fluids off the dehydrator go into tanks, and so to use those pits as a reason to change what we're doing, it seems wrong. It's certainly that the groundwater impact is not being cured by the proposed new rules.

In addition to the 284 pipeline issues, there was 160 that were reported by water disposal companies. And again, there may need to be some changes in how the water disposal companies operate. But I'm going to guess that a lot of the groundwater impacts that were reported by the water disposal companies -- and a good chunk of that is in southeast New Mexico -- are more a result of leakage around the equipment that they have and again will not be affected in any way by what we do with production pits or drilling/reserve pits.

There was 15 commercial impacts which had to do with some commercial company having a spillage in their yard, loading chemicals or something leaking from a drum.

So at any rate, I think there's a lot of data in that that should not be used as evidence that we need to change production and drilling reserve pits.

The one that the -- I said that Dugan Production had not ever had a groundwater impact. There is one well in there for Dugan Production, but that isn't correct. Dugan Production is not the operator of that well. It's

the Knight Number 1, which we did help the operator on a contract basis to remediate a groundwater impact. But it again was not a well operated by Dugan Production, even though that's the way it's listed in the data file. That same well is listed under Enterprise as a groundwater impact. So at least the one pit I know something about, it's on that data set twice.

For Dugan production they show that the groundwater was at zero feet. For Enterprise they show the groundwater at the same pit was at 25 feet. I'm not sure where that data comes from, but I was doing that work, and neither of those numbers are correct.

If I was to use that data set t try to find locations -- where are these pits and these groundwater impacts? -- there's a whole lot of questions that I have as -- Wow, where are they?

If you divide the data up into north -- in other words, it does have a northern township and a southern township, in other words 25 north or 25 south -- if I sort that and figure out where the pits are, a good -- about half of them are in the northwest, and about half of them are in the southeast.

But of the northwest pits, if I use the location that's in the file, about 65 of those are in Arizona. Because the western range that's assigned to them are

greater than 21, and 21 West is the Arizona-New Mexico border.

So I'm not saying those pits are in Arizona, I'm just saying that the data is -- I'm very suspicious, rather than 25 west, it's actually 25 east, and those pits are probably in southeast New Mexico. So they probably are actual groundwater impact.

But my point is, the data has lots of questions about it. And if you were to use that as a sole justification for implementing the changes we're talking about, you know, I -- as a professional engineer I'd say, Wait a minute, there's a lot of clouds over this data set that -- and I want to emphasize that a lot of the groundwater impacts that occur in that data set are the result of operators becoming compliant with wells that are either in the initial vulnerable area or the expanded vulnerable area, and so those pits are gone. And we're not doing that anymore.

And so we're fixing a problem now that has already been dealt with either under the vulnerable-area issues or under current Rule 50.

So that's pretty much what I had to say.

CHAIRMAN FESMIRE: Okay. Are there any questions of this witness?

MR. BROOKS: I think not, thank you.

MR. HISER: No, sir.

CHAIRMAN FESMIRE: Mr. Roe, I do need to point out a couple of things. That database is as reported by the operators, and the zero is the default value. If they don't report a water depth, it comes out zero.

THE WITNESS: Well, having worked on the Knight Number 1, I -- we did report a water depth, and clearly El Paso reported one at 25 feet, which isn't right either. It was shallower than that, our Enterprise, but --

But again, Mr. Fesmire, the point I was trying to make is -- There's no question the industry needed to do better with their pits, and I don't think anybody in the industry would argue with that. But we will argue that we've already dealt with a lot of these issues.

You know, the OCD implemented -- the Director at that time set up a task force to deal with the vulnerable area issues. In fact, it was Bill's master's thesis that initiated that effort, I think. Is that right?

And the OCD and industry invested a tremendous amount of time dealing with the pits under the vulnerable area and the expanded vulnerable area. That was a work effort that started in early '84 and basically lasted through -- probably -- the expanded vulnerable area became effective in early '93, and most of the operators had to get their wells in compliance -- and compliance meant that

you eliminate use of pits in areas that there is some exposure to groundwater contamination.

And so from '84 to '96 industry and OCD spent a tremendous amount of time working on that.

Then we had Rule 50. I personally spent pretty much six months of dedicated time getting our wells in compliance with Rule 50. Now that we're finally compliant, we're going to eliminate Rule 50 and come up with another rule that -- I'm sure we'll do what we need to get in compliance, but I sure wasted six months of time dealing with Rule 50.

CHAIRMAN FESMIRE: Commissioner Olson, you had a question?

COMMISSIONER OLSON: Well, I just wanted to clarify a couple points.

EXAMINATION

BY COMMISSIONER OLSON:

Q. I think you said you spent -- if I understand right, you said $1.5 on pit closures, I guess compliance issues with the pits since 2003; is that -- ?

A. No, since Rule 50 became effective February 14th of 2004.

Q. 2004.

A. So Dugan Production -- the pits that we've closed, it's about a million and a half dollars that I've

signed invoices for.

Q. And I think you were saying you still have 128 unlined --

A. Yeah.

Q. -- production and disposal pits?

A. Yes, that are registered under Rule 50.

Q. So I'm assuming those are outside what was considered the vulnerable area?

A. Yes, yes. And in all cases the groundwaters are for sure deeper than 50 feet. All but 13 of them are deeper than 100 feet, or nonexistent. And bear in mind, though, a lot of the San Juan Basin -- presence of groundwater, that's an issue for the -- you know, the native Americans that live out there. They haul their water, they don't have it available to produce.

Q. Well, I'm assuming those were pits that were -- that have been in existence for some time.

A. Yeah, they were in existence prior to Rule 50, and because we planned to operate them after June 30th of '05, we did, you know, file the necessary applications.

Q. And is Dugan still installing unlined pits outside the vulnerable area or --

A. No --

Q. -- are they --

A. -- no, we're joining the ranks with the rest of

the industry. A lot of industry has decided that, you know, unlined pits are clearly not the way to go.

And that's basically what happened -- you know, I mentioned we registered 242 pits. We only have 128 active now. For a lot of reasons we've chosen to close the difference between 242 and 128. That number slips my mind right now, but we've taken pits that are registered and completely legal and closed them ourselves because, you know, we're trying to be good stewards of the environment.

Q. And so what are you using now? Below-grade tanks?

A. We -- we like using subgrade tanks --

(Laughter)

A. -- not below-grade tanks, and the distinction being, the tanks are in a depression, because a lot of our operations, you need to be able to gravity water from the production separator or from your oil storage tank into some sort of a holding vessel. And so we put those below-grade -- or subgrade, and we do have an ongoing program to keep the sites cleaned out and the bottom of the tank exposed so that it won't become subject to Rule 50 as a subgrade tank --

Q. So as a subgrade tank --

A. -- or below-grade.

Q. -- it's essentially a tank sitting in a

depression with the sides --

A. Right --

Q. -- exposed --

A. -- right, you --

CHAIRMAN FESMIRE: Below pit, basically.

THE WITNESS: Yeah, it's a -- yeah, it's just tank that's below grade so that we can still produce in a manner that, you know, fluids will still drain into the tank, and we can walk around the tank and see the sides and verify that there's absolutely nothing leaking from it.

They're typically set on a gravel base with a liner underneath, so if there was a leak in the middle of the tank, it would run out and be obvious from -- or apparent from -- from walking around the tank.

And of course, clearly there's some problems. You've got to keep the sand out of the depression so your tanks are seeable, and if an operator doesn't do that then, you know, you've lost the benefit of having a subgrade as opposed to the below-grade.

Q. (By Commissioner Olson) The liner, does that come out from below the tank, or is it just the side -- the footprint of the tank, then?

A. It would extend out a little bit.

It's -- We don't have it out much, because if you get rainwater or something, you don't want to have the

rainwater accumulating in your tankbottoms, or around your tank.

Q. So what's it cost you these days to install a subgrade tank like that, with that liner and gravel base system?

A. Well, because most of our wells that we're using this on are -- we're dealing with fairly small volumes, it doesn't cost -- we can do it fairly economically. We buy a lot of the tanks we're using at auctions. They're used, we don't buy new -- or we do buy new, but Mr. Dugan prefers that if there's surplus equipment out there, that's what we used.

And Bill, I'm going to say we'll spend $3000 to $4000 for the tank, and we'll spend probably an afternoon with our own roustabout crew setting the tank.

And so, you know, for $5000 we probably are able to install. But again, we go to a lot of trouble to find the equipment. And if we're buying new equipment, you're going to spend more than that for the tank.

COMMISSIONER OLSON: Okay, thanks. That's all I had.

CHAIRMAN FESMIRE: Ms. Foster?

MS. FOSTER: Based on the questions that Commissioner Olson just asked, I just had a quick question for Mr. Roe.

EXAMINATION

BY MS. FOSTER:

Q. Mr. Roe, are you aware that under the proposed new rule that your subgrade tanks will need to have secondary containers with leak detection within five years?

A. Yes, I am, and that's -- that's why I offered -- I -- these wells are at risk of losing -- because we probably won't be able to justify that installation.

Q. Okay. And could you -- since you just gave us the cost that you'd expend on a used tank, do you know how much a tank with a double bottom would cost, or could you even buy one of those new?

A. Well, you pretty much have to buy those new. There's -- they're good -- I don't have a current price, but they'll be more than the $5000 that -- in fact, we have our own, actually tank-manufacturing company too, so we do make our own double-bottom tanks.

And I don't know, Tom, do you have a number for what we get those?

MR. DUGAN: Too much.

THE WITNESS: Too much.

(Laughter)

THE WITNESS: He prefers we buy all of BP Amoco's surplus equipment. We like when ConocoPhillips has surplus sales. We use -- we're the recycling kings.

MS. FOSTER: Thank you, I have no further questions. Thank you, Mr. Chairman.

CHAIRMAN FESMIRE: Are there any further questions of this witness?

Mr. Roe, thank you very much.

MR. ROE: Sure, thank you.

CHAIRMAN FESMIRE: At this time we'll adjourn for lunch and reconvene at 1:30. Thank you all.

MR. McWHORTER: One more.

CHAIRMAN FESMIRE: Oh, wait a minute, was there other -- were there other --

MR. McWHORTER: I'll wait till Thursday.

CHAIRMAN FESMIRE: Okay, so we'll go ahead and adjourn for lunch then.

(Thereupon, noon recess was taken at 12:21 p.m.)

(The following proceedings had at 1:39 p.m.)

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

Let the record reflect that this is the continuation of Case Number 14,015. It is Tuesday, November -- December 4th, 2007. All three Commissioners are present, there is therefore a quorum.

I believe, Mr. Hiser, you were going to present the rebuttal portion of Dr. Thomas's direct testimony?

MR. HISER: Yes.

CHAIRMAN FESMIRE: Are you prepared to do that?

MR. HISER: If you can give us just a minute to finish copying those files that you requested earlier.

CHAIRMAN FESMIRE: Okay.

(Off the record)

CHAIRMAN FESMIRE: Okay, let's go back on the record.

Mr. Hiser, I believe you had -- you were going to question Dr. Thomas?

MR. HISER: Yes.

BEN THOMAS, PhD (Resumed),

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

DIRECT EXAMINATION (Rebuttal)

BY MR. HISER:

Q. Dr. Thomas, in the testimony that we've heard from a number of witnesses there's been some discussion about the merits of the TCLP test, something called the SPLP test or the synthetic precipitation leaching procedure test, and total values.

You stated in your direct testimony that you were looking at using the TCLP for some purposes, and in the testimony of Mr. von Gonten -- and this is a long question -- the Division explained that they didn't believe it was appropriate to use TCLP for characterization purposes.

Could you address the concern about the propriety of using TCLP for characterization purposes and why as a toxicologist you wanted that information using that test?

A. All right. The TCLP test is a test that was developed by EPA to characterize waste and to define what waste was hazardous and nonhazardous.

The purpose that I proposed using TCLP was as a way to look at the percent of solid waste that was in fact soluble in water.

TCLP is -- I chose TCLP instead of SPLP because there are some data in the literature now where TCLP has been -- being shown that it seems to be a little bit more reliable as an extracting solvent than SPLP. There's a -- Texas, for example, is now using a combination of TCLP and SPLP in looking at their wastes, and particularly barium, as an approach to looking at the percent of barium compounds that are soluble.

So my purpose as the toxicologist is that, as I mentioned, it's only the soluble, ionic form of a metal that really is toxic and bioavailable. So as a result, I was looking for some way to characterize it.

TCLP is better than water, it's more severe treatment than water, because they add some acids to it. They add acids also to SPLP, so both of those I consider to be appropriate kind of a worst-case sort of analytical

procedure. You know, if it's going to get it out, these are the two solvents that it would be better than water, for my purposes anyway.

I don't know if I've answered your question, but that's the -- really the logic that I was using.

Q. Were you here for Dr. Colborn's testimony?

A. I was.

Q. And Dr. Colborn presented a series of charts showing what constituents appeared on a number of regulatory lists. Is that your recollection of her testimony?

A. Yes, uh-huh.

Q. And what -- as a toxicologist, what did you take away from her presentation of those multiple lists where these different constituents appeared on those lists?

A. Well, I was disappointed, because all she really dealt with were hazards, that is, the ability to cause an adverse effect. She really didn't talk about dose response relationships or the risk that a hazardous substance may produce, you know, in its concentration in the environment and the potential for exposure by the receptor.

So as a result, it was just kind of a general listing that -- oh, this could cause that, or this could cause that, and it really didn't give us any useful information from a regulatory point of view.

Q. And so did -- in the testimony that you heard from Dr. Colborn, did she ever present any dose response relationship or other information that was tied to the concentrations of materials found in the pits based on either the OCD data or the industry data or any data that would tend to be able to assist this Commission in arriving at a decision?

A. Not that I heard.

Q. Does the fact that a constituent can be detected in a pit necessarily mean that it's a risk concern?

A. No.

Q. In order for it to be -- in your view as a risk matter, what would there need to be in addition to just the fact of detection?

A. Well, from the risk perspective what you look for is a complete pathway of exposure, that is, not only have you had the presence of a chemical, but there's a way for somebody to be exposed to the chemical. You look at the route of exposure, that is, inhalation versus ingestion or something like that. And then you look at the dose of the chemical that the person is exposed to. So that determines whether or not they're likely to suffer an adverse effect, and therefore that is a risk.

Q. Now when you say a person, a person can be a receptor other than a human being, can they not, in the

environmental context?

A. In risk assessment, it's almost always a hypothetical receptor.

MR. HISER: Okay, that completes my questions.

CHAIRMAN FESMIRE: Let's start -- Ms. Foster, do you have any cross-examination of this witness?

MS. FOSTER: I do not, Mr. Chairman, thank you.

CHAIRMAN FESMIRE: Okay. Mr. Jantz, do you have a cross-examination of this witness?

MR. JANTZ: I do, Mr. Chairman.

CHAIRMAN FESMIRE: Why don't you go first, then.

CROSS-EXAMINATION

BY MR. JANTZ:

Q. Good afternoon, Dr. Thomas.

A. Hi.

Q. Before we start getting specifics, I'd just like to clarify in my own mind what exactly risk-assessment entails. There has to be a hazard; is that right? Of some sort?

A. Yes.

Q. And then there has to be an exposure to the hazard; is that right?

A. That's correct.

Q. Through some sort of exposure pathway?

A. Right.

Q. And then you take a look at the dose response to -- based on that exposure; is that right?

A. You look at the toxicology and determine what types of adverse effect, what dose is required to produce that effect, and what length of exposure is required to produce it.

Q. And from that you get the risk?

A. Well, you actually take a look at the analytical data and determine what the likely exposure level is for that hypothetical receptor, and from that you get the risk.

Q. Okay, okay. And so if you change any of those variables, that could change the ultimate outcome; is that right?

A. That's correct.

Q. Okay.

A. Yeah. In a lot of ways risk assessment is very site-specific, so your depth to groundwater, for example, can make a big difference, your concentration in the soil, all these different types of soil.

Q. Okay, thank you.

All right, let's get right into the industry sampling program. In your slide -- I don't have a number for it, it's in the sampling program section and it's the page right after the map --

MR. HISER: Probably about page 8.

MR. JANTZ: It begins, Twelve samples of pit contents were collected.

MR. HISER: Oh, that's page 10.

Q. (By Mr. Jantz) Okay. In your discussion about the -- well, actually prior to discussion Chairman Fesmire mentioned sample splitting. Can you explain what sample splitting is?

A. Sample splitting is where multiple parties will share a sample that's been collected so they can run it through their own laboratories and essentially confirm each other's results.

Q. Can it also mean sending parts of a sample to different laboratories?

A. It could be.

Q. Okay. And why is sample splitting used.

A. Usually it's for legal purposes so that both parties are convinced that the analytical data are fair representations of the conditions at the site.

Q. Could it also be used as a means of quality assurance?

A. That's a little bit more difficult technically, because different laboratories have different technicians, different instrumentation and so on. So it could be, but it requires a fair amount of interpretation.

Q. Sure. And the sampling program done by the

industry committee, were the samples split at all?

A. I don't believe so. I think they were collected for that group.

Q. Okay, thank you. All right.

In your discussion of arsenic -- and this is the slide that begins with the bullet point, Arsenic is not a component of commercial drilling muds.

MR. HISER: Slide 13.

Q. (By Mr. Jantz) Yes. You say that -- you conclude that arsenic exists in drilling/recycle pits, does not pose health or environmental risks. Is that because of its immobility in water?

A. It's not soluble, therefore it's not absorbable.

Q. Right. Are you aware of any conditions under which arsenic might be mobile?

A. Certainly, you can start to change its redox state so that it forms a different compound, and -- in which case you can get mobility.

Q. Okay, thank you.

A. Redox state is its valence, essentially. So rather than arsenic 2 you may have arsenic 3 or 5 or whatever.

Q. And that's also the case with other minerals such as uranium; is that right?

A. That would be appropriate for uranium as well.

Q. Okay, and uranium was also found in the pit?

A. As I recall, there were very low levels of uranium in the pit.

Q. But there was uranium?

A. As I recall, yes.

Q. Okay. Let's see. On your slide entitled What was found? - Halogenated Compounds --

A. Now that I think about it, uranium probably was at or below detectable levels. I'm having trouble remembering the exact data, but any compound that was detected -- I'm sorry, not detected but either quantified -- quantifiably -- high enough to be reliably quantified or just under that quantification level, they were included in the list of compounds that --

Q. Okay.

A. -- that were put together.

Q. Well, assuming we get to see -- work off of Exhibit Number 9, but the fact remains that the industry data was provided to the task force, and I guess when you just -- for your information, the level of uranium I have that was found is -- 1.1 milligrams per kilogram as the average in the San Juan. The Permian is 3.17 milligrams per kilogram.

In any event, when you found out about these halogenated compounds, that was only after your discussions

with the lab; is that right?

A. That's correct.

Q. And that information wasn't, to your knowledge, provided to the task force and the industry committee report?

A. There was -- there was an initial report that included these compounds as things that we had identified but didn't really understand.

Subsequent to that -- and I think that was the initial report that was submitted to the --

Q. Sure.

A. -- the task force, Governor's task force. Subsequent to that, we asked the -- had a discussion with the laboratory and they said, Oh, no, these are -- these are quality-control samples --

Q. Okay.

A. -- compounds.

Q. But those -- yeah, that -- so it was only revealed after your discussions with the laboratory folks; is that right?

A. Yeah, and we found out about it.

Q. Yeah, okay.

CHAIRMAN FESMIRE: Can I correct something? Are you talking about the industry committee sampling and their results were presented to the task force?

THE WITNESS: Yes.

CHAIRMAN FESMIRE: Do you know that to be a fact?

THE WITNESS: I reviewed the draft report so I -- yes.

Okay, now, the report that I'm talking about is a summary of all of the data and the results of the QA analysis and the evaluation of the concentrations and so on.

CHAIRMAN FESMIRE: Okay. Now when you say task force, are you talking about the industry committee task force, or the task force on the --

THE WITNESS: This is --

CHAIRMAN FESMIRE: -- proposed rule?

THE WITNESS: My understanding, this is a report initially to the industry task force, but provided to the Governor's task force.

CHAIRMAN FESMIRE: So the Governor's task force had a copy of the industry sampling results?

THE WITNESS: Yes.

Q. (By Mr. Jantz) The addition of these halogenated compounds, would that affect the concentrations of the other pollutants or constituents in the samples?

A. As explained by the laboratory, the effect on there should be minimal.

Q. Okay.

A. In other words, they use very small volumes, so there's no significant pollution.

Q. Okay.

A. These are fairly pure -- or extremely pure compounds so that they won't have contaminants that will be added to the sample.

But those are the questions that we were trying to sort through, and as a result we contacted the laboratory. I said, What in the world is this? Because I couldn't see any evidence that it was part of the formulation of drilling muds.

Q. In your conversation with the laboratory, was there any indication that anything else was added?

A. Well, they always have QA/QC-type compounds. They're usually deuterated, and -- but these I hadn't encountered before, so... But the deuterated compounds were there as well.

Q. Okay, if we go to the slide entitled OCD Sampling Program, with the bullet point starting, It appears that OCD collected samples of solids from the surface --

A. Okay.

Q. -- the second bullet point you say -- you indicate that, OCD collected water samples, suggesting that the fluids in the sampled pits had not been removed for closure.

Now you understand that -- Well, let me ask you this.

Are the contents of a pit in liquid form, before they've been de-watered for closure, before the fluids have been removed for closure -- is that -- could that be considered a hazard?

A. Could you repeat that?

Q. Could the contents of a pit before closure be considered a hazard?

A. Well, everything has hazards. As Dr. Colborn said, you know, even water you can drown in.

Q. Sure, sure. Sure, sure. Understood. But --

A. Are you asking about risk?

Q. I'm asking about the hazard part of the risk analysis.

A. Okay.

Q. So if those -- well, let me ask you, do you agree that they could represent a hazard, the chemicals in a pit?

A. Yes.

Q. Okay. If those chemicals leached out, through a rip in the pit liner, for example, or a hole in the pit liner, they could conceivably contaminate groundwater; is that --

A. Yeah.

Q. And you're aware that in fact it's happened in

certain circumstances in New Mexico?

A. I've only heard minor comments, I'm not aware of any detail.

Q. Okay. But that could be an exposure pathway?

A. Of course.

Q. In the slide entitled Conclusions from Industry and OCD Findings, Analytes of possible regulatory concern --

A. Okay.

Q. -- you went into some extent about the potential risks or lack thereof, about these, right, in your direct examination?

A. I did.

Q. Did you take a look at any -- did you do an analysis of the cumulative effects of any of these contaminants?

A. What type?

Q. Cumulative. For example, if -- assuming there are -- there are -- a situation where a number, a great number of pits are buried in close proximity to each other, would you take into account the cumulativeness or cumulative hazards, risks associated with that?

A. The answer -- the answer to that is yes and no. The cumulative risk associated with multiple oil pits, anything like that, I didn't deal with.

The cumulative risk associated with multiple contaminants affecting the same target organ, things like that, we did evaluate.

Q. Okay. Did you take -- did you do an analysis of the synergistic effects of these?

A. No, none of the regulatory paradigms for risk assessment deal with synergy.

Q. Okay.

A. It's a fairly rare phenomenon in the first place, but most of the chemicals are added to -- and the guidelines that we have make the assumption that they are added.

Do I need to explain synergy?

CHAIRMAN FESMIRE: Not to me.

THE WITNESS: Okay.

Q. (By Mr. Jantz) If you would, just for clarification on the record.

A. There are a number of interactions of chemicals. A chemical that -- two chemicals that produce a combined effect of one and one equal two, leaves two and two as equal to four, as a sample. That's considered to be additive.

There are chemicals when you put them together actually are antagonistic, two plus two equal three, for example.

There are chemicals that are synergistic where two plus two equal ten. So they're an order of magnitude or large -- it's certainly not additive, more than additive sort of a relationship.

Q. Thank you. On your slide entitled TPH Standard - Risk Critique it starts with, OCD has not given a technical rationale...

A. Okay.

Q. Actually, it's, OCD has not given a technical rationale for proposed -- that's the one, yes. Thank you, Eric.

On the second bullet point, second dash, in the analysis of groundwater you say that a significant exposure is unlikely. What is significant exposure?

A. Well, again, my preference with regard to TPH is to look at specific toxicants, as opposed to a nebulous term like this, a mixture. But essentially what I'm talking about is that the hydrocarbon that we're seeing is predominantly diesel range organics and higher. They are poorly soluble in water, they are poorly mobile in the environment.

And so, you know, what I'm looking at primarily for TPH, since we didn't find PAHs to be at high levels, is that it's an odor and taste problem in the water.

Q. Okay, and that's what significant exposure means?

A. Well, significant exposure is essentially kind of a catchy term that essentially says that you're exposed to more than you should be.

Q. Okay. Let me ask you this. When you're talking about exposure and when you're analyzing risk, what assumptions do you make about receptors?

A. When you talk about exposure?

Q. Yes, what assumptions do you make about the receptor? For example, is it a particular person, is it a generic person?

A. It's a hypothetical person --

Q. Okay.

A. -- and normally you assume that it's a male who weighs 70 kilograms, who lives at the site for 30 years, which is a 95-percent bound for staying at a particular residence.

Q. Okay.

A. You assume that he is -- has an average lifestyle in which he will eat 100 milligrams of dirt every single day, that that dirt will contain a certain concentration of a toxicant, and as a result you have now an exposure estimate. And you of course know the dose-response relationships from your toxicology evaluation, so you're able now to evaluate risk.

Q. Does the -- do the assumptions about receptors

ever change? For example, do you assume at times pregnant women or children --

A. Yes.

Q. -- as a receptor?

A. Yes.

Q. Depending on the situation?

A. Depending on the situation.

Q. Okay, and --

A. What you're trying to do is, you're trying to take a look at this particular site and determine whether or not there is an uncommon exposure scenario --

Q. Uh-huh.

A. -- in which case, you know, as a risk assessor, you really should start to evaluate that as well.

Q. For a generic -- for a more generic, regulatory approach such as this, where you have to have a rule that encompasses everybody, what assumption do you use?

A. We used three receptor-type exposure models. One was a residential-type scenario --

Q. Uh-huh.

A. -- where you have a child who is a child for seven years and suddenly becomes an adult, that the remainder of his exposure period is as an adult, and it could be 30 years, it could be -- you know, the -- 30 years is the common duration. And these are pretty much standard

EPA exposure scenarios.

The other one we used was a construction worker who's disturbing the site and now being exposed. Generally their exposures to soil are higher than, say, a resident, because they actually are getting down there and getting dirty and so on.

And then the third one we have is as a resident drinking groundwater.

Q. And the resident drinking groundwater is a 70-kilogram man, or is it the same seven-year-old kid who suddenly becomes an adult?

A. Generally we use a seven-year-old kid and then seven years of childhood --

Q. Okay.

A. -- and then adult.

Q. Okay. Okay, great. Thank you.

In the slide entitled Benzene Standard - Pathway Analysis, you say groundwater is unlike -- groundwater contamination is unlikely to be of concern, given the long time to reach water versus benzene's half-life.

Is the basis for that determination the time -- the combination of the time it takes to reach groundwater and the half-life? Is that a correct understanding?

A. You know, that's probably -- that's poorly worded, but essentially what happens is, you've got -- you

have a release of benzene. You have a certain amount being pushed down as rainwater percolates through the soil, so that will first of all become soluble.

But as you know, the geology in New Mexico is pretty interesting in that you've got a lot of evapotranspiration, salt bulges I think I have been discussed here and so on.

The same sort of thing that happens with salt happens with organics that are volatile, that you also get evaporation and possibly transpiration through plants and so on.

So what we're seeing here is that, assuming that you've got a groundwater that is a certain depth, as in the rule, that the migration pathway for benzene is long enough to allow biodegradation, evaporative evapotranspiration-type processes, so that the risk to groundwater, I think, in those sorts of situations is minimal.

Q. Okay. But in other situations where transport is -- the transport time is shortened, it may be a greater risk; is that right?

A. That's correct.

Q. For example, if there are fractures in the geology?

A. That's -- in theory, that's possible. The concentrations of benzene that we saw are very, very low.

You know, like I said, the higher -- the ones that exceeded regulatory criteria were from a single pit, they were analyzed, they were diluted a thousandfold, so it makes it a little hard to even identify benzene as really a concern.

Again, the --

Q. Under any circumstances?

A. Under these circumstances, based on the data that we collected as to what our best estimate of what's in the pit.

Remember also that the petroleum hydrocarbon is primarily diesel range, not the gasoline range, which is our benzenes.

Q. Okay. But again, if the benzene were to -- the transport time for benzene, transport time from pit to groundwater were increased by a fracture or a fault or a paleochannel, that would change this conclusion, would it not?

A. Well, what I'm trying to tell you is that the data that we have, one, is suspect and, two, shows very, very low levels of benzene. So that no matter what the transport and how fast that transport, I don't think you're going to get significant levels of benzene in the groundwater.

Q. Okay, thank you. If we go to the Alternative Risk/Consequences slide, all decisions have consequences --

A. Yes.

Q. -- your analysis of the economic impact is based on the industry committee Exhibit 10; is that correct?

A. I don't know what Exhibit 10 is, but --

Q. That's the one -- Mr. Pease --

A. Mr. Pease, yes.

Q. The same with the vehicular accidents, injuries and fatalities, that's based on industry committee Exhibit 10; is that correct?

A. Yeah. Let me make clear that I'm citing it primarily because of the types of alternative impacts. I'm not -- I'm really not depending upon his actual calculations and data per se.

As you recall my testimony this morning, what I said is that it doesn't matter, you're going to have -- if you have transportation, you're going to have injuries, you're going to have fatalities, you're going to have accidents.

Q. Sure, and I'm sure everybody can agree on that.

A. Yeah.

Q. I just want to make clear that for the purposes of this analysis you're relying on those --

A. Yeah, the numbers that I cited --

Q. -- the numbers in that report and the conclusions of that report?

A. That's correct.

Q. Okay. So in your slide entitled Conclusions, At what cost? - In lives -- yes, exactly -- this is the Exhibit 10 numbers; is that correct?

A. Yes.

Q. And you understand that the injuries -- the fatalities and injuries were calculated on a per-mile basis?

A. Yes.

Q. So if the number of miles decreases, the injuries and fatalities decrease as well; is that accurate?

A. That's correct --

Q. Okay.

A. -- they decrease but do not go to zero.

Q. You also understand that the exhibit -- industry exhibit -- industry committee Exhibit 10 didn't deal with the cost of groundwater remediation; is that right?

A. That's my recollection, yes.

Q. Okay, so that didn't factor into this -- in your analysis either?

A. No.

Q. Okay. And your economic analysis was based on that same report; is that correct?

A. Yeah, the data that I'm using are from that report.

Q. Okay. So if, for example, there were other data that showed that using, for example, closed-loop systems actually saved industry money, then that would change these conclusions that you reached; is that correct?

A. No.

Q. No?

A. No.

Q. In terms of the --

A. The numbers that I'm citing are from that report, but they're not my numbers.

Q. Right. Sure, sure, sure.

A. But again, my point is that regardless of what decision you make, there are consequences. Some are good, some are bad.

Q. Okay. But saving industry money, would you agree that that's a good conclusion or a good outcome?

A. Well, it's not for me to judge, it's for the Commission to judge.

Q. That's fine. Thank you, Mr. -- Dr. Thomas. Let me see, I think have one more -- one more line of questioning.

Can you go to the Conclusions part, Proposed Industry approach provides similar benefits at less cost?

In the first dash point up here, Small onsite pit closures versus landfills, it seems to me -- and correct me

if I'm wrong -- you're talking about if the liners don't fail, both onsite pit closures and landfills are equally protective. And if the liners do fail, onsite pit closures are more protective.

Is that -- is that -- Am I reading that right?

A. Correct.

Q. Okay. Are you aware of any pits that have long-term groundwater monitoring?

A. No.

Q. Are you aware of any pits that have contingency plans associated with them?

A. No, I haven't looked at that.

Q. Okay. Do you -- Are you aware of any pits that have rigorous geological and hydrogeological analysis associated with them?

A. Again, I'm not part of those discussions, so --

MR. JANTZ: Thank you, that's all I have.

CHAIRMAN FESMIRE: Mr. Brooks, are you prepared?

MR. BROOKS: I'm ready. Ready as I'm going to get, anyway.

CHAIRMAN FESMIRE: Okay. Is there any indication that the stuff that we're having printed is available yet?

MR. PRICE: Well, it's going to be a minimum of maybe an hour and a half to -- there's lots of information in there. I mean, we're talking about how many pages? 150

or --

CHAIRMAN FESMIRE: That's a good question.

THE WITNESS: My guess is, you're talking about a stack of paper about that tall.

MR. PRICE: And that's just one copy, so it's probably two hours from now to get them loaded, get them downloaded and get them printed. That's as fast as we can do it.

CHAIRMAN FESMIRE: Okay. Well, we wouldn't have time to --

MR. PRICE: We're trying to get more people on it right now, so...

CHAIRMAN FESMIRE: Dr. Neeper, we haven't forgotten you. I just --

DR. NEEPER: Fine, I can always holler, if I feel neglected.

(Laughter)

CHAIRMAN FESMIRE: Okay.

Mr. Brooks?

MR. BROOKS: Thank you.

CROSS-EXAMINATION

BY MR. BROOKS:

Q. Good afternoon, Dr. Thomas.

A. Good afternoon.

Q. Your specialty is toxicology, correct?

A. Yes.

Q. And I'm assuming that you have not done any groundwater modeling. There's been so much talk about modeling in this proceeding, but that's not --

A. Are you referring to this proceeding?

Q. Yes.

A. No, I have not done groundwater modeling.

Q. So you've relied on other people's work in that field of expertise?

A. The other experts in the case, yes.

Q. Let me start through your presentation, and I'm looking at Exhibit Number -- Exhibit Number 8, I believe it is. No, Exhibit Number 9, the first part of Exhibit Number 9, which is your narrative summary.

On page 2 you state that, It is my understanding that the New Mexico Oil and Gas Act requires that risk be considered in the regulatory process. What do you base that statement on?

A. My understanding is that that particular Act requires that the regulatory agency protect public health and the environment. Okay? And as I was saying this morning, that inherent in that is the concept that there is a risk that's posed that requires the agency to protect against.

Q. But you're not telling us that the New Mexico Oil

and Gas Act requires the Commission to do risk analysis?

A. No, I'm saying the OCD would be foolish to try to protect against something that doesn't pose a risk.

Q. Would it surprise you to know that the word "risk" is not used in any of the environmental provisions of the Oil and Gas Act?

A. No, it doesn't surprise me at all.

Q. Very good.

A. In fact, that's the basis of my testimony.

Q. The basis of your testimony is that it's not used in the Oil and Gas Act?

A. I'm frustrated because I'm not seeing risk being considered specifically as part of the rule that's being proposed here.

Q. Well, let's explore that just a little bit in general terms, Dr. Thomas.

Many of the toxins that you deal with may be -- or that you've studied, may be introduced into the environment in various different ways; is that not true? From various different sources?

A. Yes.

Q. And a lot of them are in the environment in the background, to some extent?

A. That's correct.

Q. And at least some of them, the risk that they

present is a matter of cumulative exposure, is it not?

A. It depends on the toxicant.

Q. Yes, I understand that. I'm just a lawyer, I'm not a scientist. You know, in law we don't look for answers, we look for arguments.

But anyway, I've heard -- I've always heard that about lead, that it's one of those for-instances, one of those --

A. Yes.

Q. -- those toxins that -- where the risk is involved with cumulative exposure; is that correct?

A. That's -- in general, that's correct.

Q. And there are others? That's just one I happen to have heard about. There are others, correct?

A. Of course.

Q. Given that -- those two propositions, that toxicants may be introduced into the environment from various sources, and that cumulative exposure is a valid risk concern, in some instances at least, would it not be reasonable for a regulatory agency, if there is a better way of doing things that will introduce less of the toxicants into the environment, to require that better way of doing things to be used, even if they had not specifically concluded that the activity they're regulating would introduce a sufficient amount of the toxicant in the

environment to present an unreasonable risk by itself?

A. The answer is no.

Q. And why?

A. The -- What you say is a good motherhood statement. But in practical terms, the taking action of that nature often will divert resources away from critical problems or important problems.

Q. And you've faulted the Commission for making value judgments, if I read your materials correctly; is that --

A. That's correct.

Q. But can the Commission regulate without making value judgments?

A. Well, the Commission can do anything it chooses. Of course, the -- you know, the one -- I don't know, the one example that I have that -- in my experience, that said that that isn't really the appropriate way to develop regulation was a Supreme Court decision with regard to benzene back in, I think, 1980. Okay?

And essentially at that point OSHA had proposed to reduce the permissible exposure limit from 10 parts per million to 1 part per million. I'm not an attorney, so I'm looking for somebody to tell me that I'm speaking out of hand. But essentially, the --

Q. Well, it would have to be Mr. Hiser. I don't

think any of the rest of the attorneys involved in this case have that kind of detailed familiarity with the history of environmental law, but go ahead.

A. Okay. So in 19- -- or in the mid- -- or late '70s, OSHA proposed to lower the permissible exposure limit from 10 parts per million to 1. And what the industry -- at that time I had just changed from M.D. Anderson Hospital as a pathologist to a consultant and toxicologist with Shell, so I was now part of the industry responses and discussions with this.

The industry had looked at their operations, and in general they met a 1-part-per-million PEL. But they said that they thought that OSHA had gone through an improper regulatory procedure to develop that regulation.

The lawsuit eventually got up to the US Supreme Court, and the Supreme Court stated the standard, saying that -- OSHA, that you can't just simply propose a regulation because it can be done. You've got to do two things.

One is, demonstrate that current levels of exposure pose a risk to health.

And two, you've got to demonstrate that whatever regulation you're now proposing reduces that risk.

Okay? And it was that decision that now started regulatory agencies to start to adopt risk-based approaches

over and over again.

In prior years what would happen is, the industry would have their army of toxicologists, and the regulatory agency would have their army of toxicologists, and they would argue back and --

CHAIRMAN FESMIRE: Well, how did the regulatory agency pay for their army of toxicologists?

(Laughter)

THE WITNESS: Well, they had them. EPA still has them, but the -- but there really wasn't a good technical basis to say that their opinion was any better than the other opinion. So they started now to develop things like these quantitative risk models as a way to formalize the thinking process, make sure that everybody understood, these are the issues, and this is what we're proposing to do to reduce the risk.

Q. (By Mr. Brooks) Well, that's a very long answer, but I still don't understand why it isn't appropriate for a regulatory agency to require an industry to minimize the amount of toxic waste that it introduces into the environment, based on the fact that -- Well, let me back up.

I don't understand why you're saying that if toxic waste can add to exposure in addition to other sources, that an agency -- that it's not appropriate for an

agency regulating one industry to require that industry to minimize its introduction of toxic wastes into the environment.

A. My answer is that you're asking a question that's kind of a generic question. There are probably toxicants where that is appropriate. Okay? But not in this particular proceeding.

Q. Okay. Well, let's go on to something else here.

Next question you ask is, what is in drilling reserve pits? And you list a number of things.

Now Mr. Hiser asked you some questions about Dr. Colborn's testimony, remember that?

A. Yes.

Q. And I will concede that Dr. Colborn's testimony was incomplete, but didn't Dr. Colborn's testimony raise the issue that there may be some things in drilling and reserve pits which are from a different source from the things you've listed here, namely additives that are put into the materials for various reasons?

A. Certainly, and I tried to include that in the formulated drilling mud --

Q. Okay --

A. -- bullet here.

Q. -- and like I say, I would concede that Dr. Colborn's testimony was incomplete. But if you were going

to do a full-scale study of this subject, did it not raise a number of questions that it would be reasonable to investigate further?

A. I don't think so, and the reason why is because even though that you can talk about certain chemicals being -- you know, at the end of the day, you know, we still didn't know what was in the drilling pits. Okay? And as a result, the recommendation of the industry was, Let's go out and analyze it, using as many of the EPA methods as we could to look at the various constituents that we expect there.

You know, they use paper and cellulose, you know, in some drilling mud formulations. We didn't try to analyze that.

But for the common constituents that are of toxic concern as identified -- the EPA, where they've identified methods that are appropriate to analyze those constituents, that's essentially what was applied to the samples that were collected out there. That's why you have so much paper that's being generated right now.

Q. Well, let's talk about this industry sampling program a little bit. When you report -- everything you report in terms of the analysis you did from the industry sampling program is in terms of averages, correct? Average levels that were detected?

A. Yes.

Q. Is that -- the term "average" is a somewhat vague term. It's used in various different senses. Is that just a mathematical average of the samples that you took?

A. We do two things. One is that if the data are normally distributed we use an arithmetic average. If the data are log-normal, then we use a geometric average.

But the concept of using average is actually specified by EPA. And what they point out in their Superfund regulations and risk-assessment guidelines is that although we talk about an individual receptor going out to a field and eating dirt that contains exactly this amount, that is, from this spot here, he does this every day for 30 years -- okay? -- in actual fact, he probably is actually going all around the site and getting exposed to contaminants in a number of different locations.

So that the EPA approach is to take the average -- okay? -- or an upper bound of the average, and then determine -- use that as the best estimate of the receptors' exposure level.

Q. But from a rulemaking standpoint, if there is -- if you have some pits that are considerably above the average, don't they present -- don't they create a risk that is not fairly reflected by the average of all pits? Assuming that this -- that the average of three -- of six

pits is -- even assuming the average of six pits is --

A. No, no, the averages that I'm talking about and the averages here are averages of the data collected at a single pit. So these are multiple samples of solids collected at the --

Q. Okay.

A. It's not taking the average over all pits, per se.

Q. But isn't the -- well, what you have here, you state, southeast New Mexico average --

A. Right.

Q. -- TPH was 7700. Northwest New Mexico average was 1800. That's averaging for three pits, isn't --

A. Yeah, you're right.

Q. Yeah.

A. You're right. And that -- that was just simply a way to summarize --

Q. And you did the same thing with the chlorides?

A. That's simply a way to summarize the differences between the two regions.

Q. Well --

A. The analysis that I'm talking about really is looking at the average of each individual pit in order to make the determination whether it poses a significant risk, and it's based upon EPA guidelines.

Q. Now in collecting their samples, did the industry filter the samples in the field before analysis?

A. My understanding is that they did not.

Q. Would that not have been a better way to determine solubility than the use of TCLP test?

A. Filtration removes particulate, and unfortunately it's not 100-percent efficient so you get some suspended particulate anyway.

Q. But it avoids the diluation inherent in the leachate tests, does it not?

A. I'm sorry?

Q. It dilutes less than the TCLP test, does it not? Dilutes the sample less?

A. Well, they're different procedures. But SPLP and TCLP were diluted in the 20 volumes of liquid, of --

Q. Now, you've talked about -- you've talked about and discussed arsenic and benzene. You also looked at the OCD's sampling program too, didn't you?

A. Yes.

Q. And I've got to go to --

(Off the record)

Q. In Exhibit 16 --

MR. HISER: I presume, Mr. Brooks, that's OCD Exhibit --

Q. (By Mr. Brooks) OCD Exhibit 16, I'm sorry. In

their summary in the solids analysis OCD found exceedences for benzene and toluene and some other hydrocarbons and also for arsenic and barium. And you've considered arsenic and barium. They also found an exceedence for lead, and you didn't consider lead. And that was in the -- that was in the tables for the industry committee reports too. Why did you not consider that?

A. I believe we did. That's why it's in the industry report.

Q. Okay, I didn't see -- I didn't see any analysis of that, comparable to your analysis for the other constituents that you have here in your materials.

A. Yeah, and my recollection is, it didn't exceed the regulatory criteria.

Q. Okay. What is reported here under lead, under OCD's table, is maximum northwest 121, maximum southeast 195. Then for the industry committee northwest maximum was 210. And the standard for comparison -- I have to get over to the other table --

COMMISSIONER BAILEY: Mr. Brooks, what page are you on?

MR. BROOKS: Well, I was on page 33, but I realize I need to be over on page 40, because that's where the standard is given. And this is on leachates.

Q. (By Mr. Brooks) And you're right, the industry

committee did not show an exceedence on that, so there was some computation involved in what the OCD was doing on page 33. But the OCD sampling showed 1.87 maximum northwest and 200 maximum southeast, and the standard is shown to be .05 milligrams per liter. But you --

A. I've not seen the data tables that you're -- you know, the only data that I had was from your website.

But let me repeat the point that I made before, and that is that it's not considered to be appropriate to look at a single data point, such as the maximum concentration ever seen anywhere. The EPA guidelines suggest that what we really ought to be doing is looking at an average so that it takes into account that people move around on the site.

Q. And the OCD samples also found an exceedence on mercury, did they not? Again on page 40?

A. I'm sorry, I haven't seen those tables.

Q. And you go on to talk about benzene. Are you aware that benzene has been found in groundwater in OCD abatement cases?

A. It wouldn't surprise me.

Q. So you're not saying that benzene cannot make its way to groundwater, are you?

A. No.

Q. And is not benzene one of those -- one of those

-- and I don't know the answer to this, so it's dangerous to ask anything you don't know the answer to, but is not benzene one of those toxicants that can have cumulative exposure effects?

A. That could -- ?

Q. Is it not one of those toxicants that can have cumulative exposure effects?

A. No.

Q. But it is dangerous in very small quantities, right?

A. In actual fact, no.

Q. In actual --

A. But the regulatory -- the regulatory agencies assume all carcinogens act by a mechanism that has no safe levels of exposure.

Q. And that was the reason I was surprised at your answer, because if there's no safe level of exposure that would suggest that it's dangerous in very small quantities?

A. That's correct. It's what -- that would be the case if it were true. The data on benzene is pretty clear that it requires a level of -- for a leukemogenic effect, it requires a level in excess of 100 parts per million as an occupational exposure.

Q. Well, even if you're -- and going back to cumulative exposure, the concept of cumulative exposure as

we're talking about it in the case of lead is exposure one time and then exposure somewhere else at some other time, right?

A. That's right, and that it accumulates or is retained in the body, so that your total dose is the result of multiple additional exposures.

Q. But when you're talking about the constituents that are introduced into water, if you get some in the water from one source and some in the water from another source, then someone who's exposed to the water is exposed to the total that comes from all sources into that water, right?

A. Well, benzene is also in strawberries, pecans, things like that, so you can get -- you get a cumulative dose, absolutely.

And the question is always not whether you've been exposed but to what extent you've been exposed? What is the dose total? And what is the health implication of that dosage?

Q. But doesn't that get back to what I was saying about waste management, that it's appropriate for a regulatory agency to limit the addition to water or some other exposure source of toxicants that may already be there or may be there from other sources, even if the amount involved is not sufficient by itself to cause what

you would characterize as an unreasonable risk?

A. Well, let me repeat. There are certain toxicants where I'm sure that that is appropriate. But they're not the ones that we're talking about here.

And in general, I don't really agree that that's an appropriate regulatory response.

Q. Well, the only reason you suggested, that I understood, why it wasn't was that there might -- that implementation of best waste management practices that minimize the discharge of pollutants might have some other adverse consequences, right? Some --

A. That's one point.

Q. There might be some collateral damage?

A. That's one point.

The other point is that the OCD has limited technical people, and to require them to go and evaluate all the different tests and things like that may not be an appropriate use of their time and effort, or budget.

Q. With regard to the collateral damage, doesn't that mean that -- simply that you have to make a value judgment, which is the greater concern?

A. Yeah, and the point that I'm making is that you need to make value judgments that are transparent so that everybody understands, this was a value judgment, and this is the reason why we've done it this way. Because without

that, how do you ever evaluate what is an appropriate exemption or change of the standard? I mean, what are you trying to protect against?

Q. Okay, total petroleum hydrocarbons. When you say that freon has been banned in the US, is it not only -- is it not just a matter that the manufacture of freon has been banned or --

A. No --

Q. No.

A. -- use of freon has been banned, the freon that they're -- that's specified in 418.1. Freon is a brand name for the multiple types of freons.

Q. And you're saying it's not legal to use existing stocks?

A. I'm sorry?

Q. You're saying it's not legal to use existing stocks?

A. That's my understanding.

Q. And what reference would you cite to that -- for that --

A. It's banned by EPA, so I would assume that the EPA has appropriate document- --

Q. But you don't know what rule, you're not --

A. Not off the top of my head, no.

Q. Okay. And you say another problem here -- you

say that TPH analysis can be effected by leaves and plant debris in material. Would you expect to find leaves and plant debris in a pit sample?

A. I don't know. We're talking an awful lot about grasses and native plants and things like that. You know, I have not been out there myself, I don't get out there very much anymore.

But the -- but you know, I -- all I'm doing, really, here is cautioning that an extraction procedure for a mixture as complex as petroleum hydrocarbon, or what we're calling petroleum hydrocarbon, is -- needs to be interpreted with some caution that the solvent extraction procedures will also extract waxes and fatty acids from the oils of the plants and give you a false reading.

Q. Are you aware that the first thing you do when you grade an oil and gas location is to scrape off all the vegetation?

A. I'm aware of that.

Q. And you're aware there are not a lot of trees in New Mexico that are going to be overhanging?

A. No, I noticed that.

Q. Okay. Now you were part of the surface waste management rule proceeding, were you not?

A. Yes.

Q. And were you aware that the 2500 TPH standard was

something that the Commission came to the conclusion to adopt in that proceeding?

A. I don't recall.

Q. Okay. You said something about something as complex as hydrocarbon evaluation. There are quite a lot of constituents in hydrocarbon material, are there not?

A. Yes, there are.

Q. Specific substances?

A. Yes.

Q. And --

A. I assume you're talking about petroleum.

Q. Yes. Have the effects of all of those been carefully studied?

A. No.

Q. And would it not be a very complex procedure to determine the actual constituency of particular -- the actual concentration of particular constituents in the hydrocarbon mixture?

A. No, it's actually not that difficult.

Q. But the total petroleum hydrocarbon gives you a -- however you measure it, gives you an overall view of what you have, what you're dealing with, right? That it has --

A. In -- What type of petroleum hydrocarbon assay are you talking about?

Q. Well, we -- the rule specifies one way of measuring total petroleum hydrocarbon. You've proposed a different way, which measures two different ranges, right?

A. The rule says 418.1 or other method --

Q. Right --

A. -- approved by the --

Q. -- well -- well, that's true --

A. And what I'm doing is giving some advice --

Q. -- approves other methods.

A. -- to the OCD.

Q. But an overall TPH method is -- testing method, is much simpler and less expensive than a detailed TPH method that would test for a wider variety of substances; is that not true?

A. 418.1 is cheaper and easier to conduct.

Q. And it does give an indication of what you've got in terms of hydrocarbons, right?

A. It also contains other things, other than hydrocarbons.

Q. Such as leaves and plant material?

A. Right, fatty acids.

Q. And why would you have fatty acids in a --

A. I'm sorry?

Q. -- in a drilling pit?

Why would you have fatty acids in a drilling pit?

A. Well, there are some additives that are based on fatty acids.

Q. Now when you go to considering chlorides, you don't dispute that chlorides in groundwater create -- involve risks, do you?

A. Chlorides? The risk is fairly small. The primary concern is more sodium and some of the cations.

Q. Well, are you aware that in southeast New Mexico sodium chloride is by far the most common salt that you find?

A. Absolutely.

Q. And the concentrations you find in southeast New Mexico at the pits are quite high?

A. Yes.

Q. So you don't dispute that there's a risk involved there?

A. With sodium chloride?

Q. Yes.

A. No, I don't dispute that.

Q. Assuming it -- assuming it is transported to groundwater?

A. I presume it's transported.

Q. Yeah --

CHAIRMAN FESMIRE: He's asking the question -- he's asking for clarification of the question, Mr. Brooks.

THE WITNESS: I couldn't hear your --

Q. (By Mr. Brooks) Assuming it is transported to groundwater, you don't dispute that it creates a -- that it involves a risk? Sodium chloride?

A. It certainly affects palatability of the water.

Q. It affects whether or not the water can be -- can safely be drunk, if it's large enough?

A. If it's large enough, that's correct.

Q. And it affects the usability of water for agriculture, because different plants have different salt tolerances, right?

A. That's true. That's all based on sodium.

Q. And there are some kinds of plants -- some levels of salinity that cattle will drink and some that they won't?

A. There are some that I won't drink either.

Q. Probably the cattle will drink -- will be more tolerant of salt than you will?

A. Could be, could be.

Q. But you've suggested -- you used the number here of 3500 parts per million. I don't -- and I use parts per million because we talk sometimes about milligrams per liter and sometimes about milligrams per --

A. -- kilogram.

Q. -- per kilogram, and those both compute to parts

per million, given certain assumptions, do they not?

A. They do.

Q. Now you've used the figure of 3500 parts per million, which I gather you're applying to the waste. What exactly are you applying that to, 3500 parts per million?

A. That number was based on Dan Stephens' -- Stephens' groundwater modeling and transport of a bolus of salt to the groundwater.

Q. Exactly, and that was going to be my next question. You based that on Dr. Stephens's work, did you not?

A. That's right.

Q. Did you base it on anything else, or just on Dr. Stephens's work?

A. On the results of his modeling, because these models are a little bit more specific for Louisi- -- for New Mexico.

Q. And Dr. Stephens was talking about, was he not, 3500 parts -- or 3500 milligrams per liter in an SPLP leachate?

A. As I recall.

Q. And the SPLP leachate involves a 20-to-1 dilution?

A. Correct.

Q. So 3500 parts per million in the SPLP leachate is

equivalent to 70,000 parts per million in the waste? 70,000 milligrams per kilogram in the material from which you extracted -- the material you extracted to do the leachate test?

A. I'm not following all your numbers, but let me -- let me -- you multiply by 20, whatever the --

Q. Okay, well --

A. -- and that would be your --

Q. -- 3500 times 20 is -- 3500 times 20 is 70,000 --

A. Okay.

Q. -- is it not?

A. And that's a crude estimate of the concentration in the solids.

Q. Yeah. And are you aware that the actual number that Dr. Stephens derived that he said would not be transportable to groundwater and create an exceedence of standards in that groundwater was actually 24,000 and some?

A. I didn't get a chance to hear --

Q. Okay --

A. -- his testimony.

Q. -- that's fine.

Now when you talk about the 3103 constituents you say over here on page 13 of your materials, Groundwater is unlikely to be a concern given dilution and attenuation processes, and you have DAF greater than 100. Why do you

use DAF greater than 100?

A. The -- Can you get that slide up? The -- Again, that's based on Dan Stephens, and they're estimating that the DAF from their model would be equivalent to a DAF greater than 100 in New Mexico.

Q. We're talking about a pit that's somewhere in the range of 100 by 100, are we not?

A. Yes.

Q. And are you aware that the EPA chart indicates for a 100-by-100-foot pit that you would have a DAF of 22?

A. Well, DAF depends upon the soil type and things like that, the dilutation, attenuation factor. It's not necessarily based upon the size of the pit, per se, although there's guidance for pits of different sizes. You make assumptions with regard to what appropriate DAF would be.

Q. Well, the size certainly makes a difference, doesn't it?

A. The mass, total mass of the toxicant in that makes a difference.

Q. Right, and given the concentration, then the mass of the toxicant will be dependent on the size of the waste value?

A. Correct. That's the reason why I was saying that I'm not sure that it's such a great idea to take all your

small pits' contents and put them into a big pit.

Q. Well, since you've gone to that -- since you've gone on to that, let me ask some questions about that.

Do you know how many landfills there are in -- how many oil and gas landfills there are in southeast New Mexico at the present time?

A. No.

Q. Would you believe there are four?

A. You're talking about OCD-approved land- --

Q. Yes.

A. That I know, it's four.

Q. And of course if this rule is passed, there are likely to be some more, are there not?

A. I would assume so.

Q. The market system is still operating. But there's going to be a huge difference between the number of landfills there are going to be and the number of pits there are going to be, probably?

A. Why is that? Volume is the same.

Q. One pit per well.

A. Volume -- volume is going to be the same, total volume.

Q. You're suggesting that people are going to go out and build landfills equal to -- one landfill for each well?

A. Maybe I didn't understand your comment.

Q. Well, my suggestion is that when you haul -- when you require that waste be dug and hauled, that it's going to be to the advantage of -- to permitted facilities, that it's going to be to the advantage of industry to -- or whoever does it, to establish centralized locations so that they can keep hauling the waste to the same place.

A. I don't recall saying that.

Q. No, I didn't say you said that, I'm suggesting that -- I'm asking you if that's not a reasonable assumption.

A. I have no idea.

Q. Okay. Well, then let me -- if you're not willing to concede that, then let me ask you to assume, for the purposes of applying the concepts that you're going to -- that you're talking about, that the order of magnitude and the number of landfills we will have is more in the range of four than it is in the range of 10,000, or however many pits we have -- we have had in New Mexico with all the drilling activity we've had.

Will it be -- not be a lot easier for this agency or its successors to monitor what is going on with those landfills than it will be to monitor what's going on with 10,000 pits?

A. It could be. The concern I have is strictly from the -- is not from the enforcement side, per se, but rather

it has to do with risk. And what I'm really saying is that if I've got 1000 on-site closures of one unit of waste each, the potential impact to groundwater is very different from those spread out over a large area than it would be, having the 1000 units of waste put into a single pit.

Q. Well, if it's in a single pit, you're going to have more waste -- more impact than you will have at any one location from the dispersed pit, right?

A. That's correct.

Q. But if there are dispersed pits, to use Dr. Neeper's expression, almost everywhere, is there not going to be a probability of a very considerable cumulative impact on an aquifer?

A. Well, the constituent that I'm most concerned about is salt --

Q. Right.

A. -- and now it's a matter of -- a question of regional geology and the groundwater and so on, I think. You know, like I said, 1000 units of salt released when the membranes fail from a large pit gives me more concern than it does from small pits that are failing. And I -- that's just a conceptual idea that I have.

Q. Well, if you get that 1000 units of salt from dispersed pits into the aquifer, is it not likely to be pretty difficult for somebody who gets concerned about the

increased salinity of the aquifer to figure out exactly where it's all coming from?

A. Shouldn't be. Shouldn't be. I mean, we deal with this with toxic chemicals all the time. We look at the plume and look at the potential sources.

Q. But if it's coming from many, many different sources in small quantities, isn't that going to be harder to identify?

A. Shouldn't be. We know the direction of groundwater flows, so we know the approximate location of that source. We can certainly take electrical conductivity or some measure like that and trace it right back and look at the boundaries of that plume.

Q. Or of those plumes?

A. Or of those plumes.

Q. If you've got 2000 of them.

A. Right. But I can assure you that dealing with the load of 1000 units of salt, it is an order of magnitude more difficult than small little impacts.

Q. You're familiar with the fact that there are monitoring requirements at landfills, are you not?

A. Yeah.

Q. And the industry's proposal does not recommend any monitoring requirements for these individual thousands of pits, correct?

A. That's my recollection, but I don't know the details.

MR. BROOKS: Okay. I actually believe that's all the questions I have.

CHAIRMAN FESMIRE: Dr. Neeper, you indicated you might have some questions?

DR. NEEPER: Yes, I have some questions.

CHAIRMAN FESMIRE: How long do you think it'll take?

DR. NEEPER: I would guess 25 minutes at the most.

CHAIRMAN FESMIRE: Okay. Is Dr. Thomas available Thursday?

MR. HISER: Dr. Thomas, what's your availability later this week?

THE WITNESS: Thursday I had a meeting, but I think I can change it around.

CHAIRMAN FESMIRE: So if we don't finish today, remembering that we're going to quit a little early today --

MR. HISER: Are you -- is Friday --

THE WITNESS: Friday is --

MR. HISER: -- as well --

THE WITNESS: -- is actually the best day for me.

CHAIRMAN FESMIRE: Okay. Why don't we go ahead

and take a 10-minute break. When we come back, Dr. Neeper will do his cross-examination then.

(Thereupon, a recess was taken at 3:03 p.m.)

(The following proceedings had at 3:18 p.m.)

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

Again, the record should reflect that this is the continuation of Case Number 14,015, all three Commissioners are present.

I believe, Dr. Neeper, you were going to cross-examination -- -examine Dr. Thomas.

DR. NEEPER: Thank you, yes.

CROSS-EXAMINATION

BY DR. NEEPER:

Q. Good afternoon, Dr. Thomas.

A. Good afternoon.

Q. We have been acquainted, we know each other, but for purposes of the record again I'll introduce myself. I'm Don Neeper, I'm authorized to speak on behalf of New Mexico Citizens for Clean Air and Water.

One thrust of your testimony seems to be that on-site burial should not be prohibited unless there's a risk to groundwater or a toxic risk to persons. Is that a fair assessment?

A. Yes, it is.

Q. And that potentially the Commission, in

considering a broader form of regulation or a more blanket form of regulation, might in fact be making more of a value judgment; is that also a fair assessment of your --

A. That's correct.

Q. If we look at that in a broad and societal sense, then, would we also say other industries ought to be allowed to bury their wastes on site wherever they are? Should that apply broadly?

A. I believe so --

Q. And that's a --

A. -- if the situation and the constituents of concern are such that is an appropriate strategy.

Q. In that case, then, the assessment of risk would really become quite site-specific, one would have many sites, and I believe you have said the sites are different, sites will be very different in their response to contamination or their distribution, how they would cause a risk; is that --

A. They can be. Certainly we've seen data that says that many of the things we're finding in the southeast are not the same that we find in the northwest.

Q. So -- but in terms of a given burial or a given disposal, then, does that imply that our evaluation and our compliance should be done on a site-by-site basis? Can we not have broad regulation?

A. Well, there are two answers to that. One is, I think that you can make strategic decisions with regard to areas that are so similar that they deserve to be lumped together and make judgments that way.

There's still a basis for concern that there are site-specific things that make the site more at risk or less at risk, and I think OCD has already proposed that there be an entire plan with geology and engineering and everything submitted before the permit is even granted. So to a large extent that's already done.

Q. Some of the discussion has been around the question of distributed disposal versus centralized or common disposal. Is there any over-arching risk analysis, any broad risk analysis, perhaps, that looks at how a society or regulatory group handles the situation of multiple small risk -- releases, versus a single large release? Do we have any broad studies to guide us on that?

A. There are studies, you know, certainly in the literature that talk about the different tactical approaches to the problem. I don't know of any off the top of my head, but certainly I have seen a number of studies like that.

I'm not sure I answered your question, however.

Q. Well, I would -- in follow-on I'd say, is there an answer that comes out of that, that can guide us, that

says yes, centralized things can be managed better, or no, it is better to handle little things one at a time, and we find that through --

A. Yeah, it really depends on the nature of the issue. You know, in some cases, a distributed sort of disposal pattern is beneficial, and I think that's the case here where we -- where I'm concerned about the bulk of sodium chloride that may be released to the groundwater.

In other cases, the centralized thing certainly has some advantages and could be appropriate.

Q. In your testimony I understood that you regarded landfills as having liners, individual pits as having liners, and that a leak in one would be somewhat like a leak in the other. That is, if a liner in a pit failed, a liner in a landfill could also fail. Is this in line with your thrust?

A. That's correct, yeah. I'm suspicious that liners will fail in time.

Q. Would you recommend, then, that site-burial units have the same liner requirements as big landfills?

A. Again, it really depends on the engineers and the feeling of what will happen with that mass of contaminant.

Q. So there isn't a general guidance on that?

A. No. If you're going to permit individual sites already, then that could be taken care of at that very same

time.

Q. Is there perhaps an assumption that hasn't been mentioned, and that is that with a centralized disposal facility there would never again be a site disturbance that with individual sites, the landscape, one cannot in any social way protect against future disturbances?

A. Well, you could make that argument. I think that there are legal ways and remedies around that problem.

In Texas we certainly have notification of landowners, we have property records that are identified during title searches and things like that, that this in fact is a site and that it has limited -- it was closed with certain assumptions.

Q. Okay.

A. So the person who's now changing the use or intended use or expected use of a property now bears responsibility of making sure that whatever was buried there in the past doesn't pose significant risk to -- for that new use, you know.

So I think that there are ways to make sure that the right things happen.

Q. So you would recommend, then, that a pit on a site, if it contains buried contaminants, should have a tag in the property title? I don't have the right legal term for that, but it's a piece of the title.

A. It's possible. I mean, again it depends on the nature of the contaminants and what's left and so on, as to what degree we need to have if we go to that type of program.

Q. Okay. You had suggested that TPH was an inappropriate measure of contamination for petroleum items and that the rule should be based on individual hydrocarbons. Do I understand that correctly?

A. Actually, those are two separate points. The TPH, as it's being proposed in the rule, I think is an inappropriate way of measuring.

My preference is to look at the individual constituents with regard to the health concerns that they raise, and for that purpose I would say that BTEX and PAHs are more appropriate measures than TPH.

Q. Would the operator in the -- your ideal situation be required to do individual tests, or would all the answers that he would need come through one or two single broad tests?

A. Well, the BTEX can be done by an EPA method, or it can be done as part of what we call volatile organic compounds. The PAHs are part of the semi-volatile organic compounds and could be done with that type of a test, or there are also EPA-specific methods for groups of polycyclic aromatic hydrocarbons.

So I guess the answer to your question is that there are tests available so that you don't have to run a unique test for each polycyclic aromatic hydrocarbon, nor unique tests for benzene, unique tests for toluene and so on.

Q. But you do, then, with a test get back a quantitative number for each polycyclic; is that right?

A. Yes.

Q. And so the regulatory agency, then, should establish a number for each polycyclic?

A. It could.

Q. I recognize it could, but it's a laborious process --

A. Yeah --

Q. -- but that is your recommendation?

A. -- yeah, the EPA does that. They have what they call a toxicity equivalent, and they will express everything as -- relative to the potency of benzoate pyrine, for example --

Q. Yes.

A. -- and so you get -- you're able to sum this compound, which is one-tenth of the potency, and then just multiply the concentration by .1 and get the -- a TEQ.

Q. But you have a number for each --

A. You do.

Q. -- individual hydrocarbon?

A. You have a potency number for each.

Q. The current statement of the rule, if I understand it correctly, would allow the operator to leave about 2500 milligrams per kilogram TPH, whatever that may mean, in the soil because that's the limit that would be allowed --

A. Yes.

Q. -- right? That's about a quarter of a percent petroleum material?

A. Yes.

Q. Under your ideal system, then, the operator would not be limited in the quantity of heavy hydrocarbons that he could leave, including should there be any asphaltines and the like?

A. The -- again, the answer really depends upon the objective the OCD is concerned about. The -- you know, the asphaltines we put on roads all over the state, and --

Q. They're not toxic?

A. And they're not toxic. And so, you know, now the question is, do you want to control for staining of soil or something like that? And that may be a legitimate rationale for controlling that.

Q. Is that a legitimate rationale? That's -- in the sense --

A. It could very well could be. I mean, there are people who object to having stained soil --

Q. Yes, it's --

A. -- and so that may be --

Q. -- it's neither toxic, nor is it a threat to groundwater?

A. That's correct.

Q. So you then would allow, at least in that case, regulation of a substance that is neither toxic nor a threat to groundwater?

A. I would allow that. But again, it really depends upon the objective. What is the concern? And stained soil may justify all the transport and associated alternative risks as well.

Q. You suggested that the concern with salt is the potential impact on groundwater -- I thought I heard you say the potential impact on groundwater only.

A. No, no --

Q. Subsequently, I believe you said there is also a concern with living things that is just due to the sodium component; is that correct?

A. Primarily the sodium component, correct.

Q. Have you ever heard of the plant disease called chlorosis?

A. I have.

Q. Is that due to sodium or to chloride?

A. No, that's due to chloride, but it's a -- in the grand scheme of things, the thing that I'm more concerned about is sodium.

Q. Would the equivalent to the threat or the problem with sodium in terms of biota be also essentially the same thing as what we would measure as the osmotic pressure or osmotic capability?

A. Yes.

Q. So the two are in essence two halves of the same thing? The restriction of sodium -- restriction of water molecules by sodium or their reduction in pressures by what we call osmotic pressure, you would call --

A. You can say that they're the same thing.

Q. So in places in my testimony where I've used the term osmotic pressure, you would find that to be equally well expressed in terms of your statements of effects of sodium?

A. Yes, and a shell of water surrounding the sodium atom.

Q. Right, thank you. That means we are not arguing.

A. No, no. I reviewed your testimony, and I agree with you.

Q. Okay. Per unit chloride, the, is calcium chloride much less harmless, or how much less harmful than

sodium chloride?

A. Well, calcium chloride -- calcium doesn't form the shell of water that sodium does, and therefore it's less of a concern with regard to autotoxicity. Calcium chloride, as I recall, is added to Dasani water as part of the taste things. So in the grand scheme of things it's of less concern to me than sodium chloride.

Q. Yes. It's less of a concern, but do we have any relative measure in some sense, like it's half as harmful or a quarter as harmful or a tenth as harmful?

A. Just off the top of my head I'd say probably something on the order of half.

Q. You've suggested testing for sodium as an indicator of release, rather than testing for chloride, which the rule --

A. Yes.

Q. -- currently specifies.

Are you aware of the simple test kit for chloride that's supplied by Kerry Sublette of the Integrated Petroleum Environmental Consortium?

A. I've heard about it.

Q. This is a very simple test kit, I would state, if you agree. And with this kit as an example, wouldn't it be much cheaper and easier for an operator to scan his own pit or his own area for chloride than to scan for sodium?

A. Yes.

Q. So testing for chloride, then, would be much easier and cheaper for the operator, simply as a means of testing whether there's been a release or a leak of some kind?

A. Yes, should be.

Q. Are you aware of OCD sampling data that shows some pits have very high sodium relative to the chloride, that is, more sodium in a numerical count than chloride?

A. I'm not sure that I'm familiar with the specific data, but I can believe that.

Q. All right, if -- then let us hypothesize there were such data. Would these additives -- would these things potentially come about as a result of adding sodium carbonate or sodium hydroxide to the drilling fluid?

A. Could be. Also there's natural carbon dioxide coming from the atmosphere and so on, so I wouldn't be surprised to see, you know, those anions also present in the sample.

Q. Present, but probably not in the quantity of 100,000 parts per million?

A. Yeah -- well, it depends -- it depends -- you know, there are -- barium carbonate, you know, for example, is not very soluble in water. So even though you've got the carbonate there, in fact, generally it is not in

solution, and therefore is not really a major contributor to the sodium carbonate or whatever.

Q. But if you have twice as much sodium in a sample than chloride, on a numerical, atom-by-atom count --

A. Then you're assuming that there are other anions that are binding with the --

Q. -- then you're assuming --

A. -- sodium.

Q. -- there are other anions. Would these additives that might have caused that -- and we're assuming very high concentrations here -- cause a high pH?

A. Could.

Q. Are you aware that measured pH's may be the range of 9 to 11 in pits?

A. I've seen data like that.

Q. Would this be toxic to subsurface biota? In other words, as we look forward into the future, would there ever be a problem from just the pH of the material that one buried?

A. It's possible. Every plant has its own preference with regard to pH and other nutrient-type conditions. So I mean, in concept, yes. It depends on the plant.

Q. Did you consider pH in your risk assessments?

A. We did in a very general term. There really

aren't good guidelines for autotoxicity or exceeding the tolerance levels of different types of plants, not that I'm familiar with anyway.

We normally look at pH as a concern with regard to eye and skin irritation, and so, you know, we have to exceed -- well exceed 9, in order to start to see those kinds of effects in animals and people.

Also concern about GI irritation, and of course the stomach is an acidic environment, so these alkaline-type pH's that you're talking about are neutralized pretty quickly in the stomach. You know, we consider it, but not in terms of autotoxicity.

Q. Would it also affect other subsurface biota, worms, invertebrates, whatever it takes to make a healthy ecosystem?

A. It's possible.

Q. You had discussed in your testimony the SPLP leachable standard of 3500 milligrams per liter chloride and said you thought that was protective.

A. Yeah, based on what I've seen in Dan Stephens' report.

Q. The previous questioner touched on this, so I'm going to phrase the question in a different way.

Can you say how much salt that represents back in the original soil? Suppose you measured it in terms of, as

it's often stated, milligrams per kilogram of dry soil or percent by weight.

A. Yeah, I tried to evaluate that, and not necessarily with that particular concentration, but tried to evaluate the different types of salts that would likely be formed and based on that data that the industry group had collected.

I'm not sure I can do it in my head, but it's -- so you may have --

Q. It's simple arithmetic, but I agree, it's not what one wants to do in one's head.

Would it at all sound reasonable to you if I suggested that might be more than 10-percent salt by mass, by weight?

A. That could be. Could be. Is that assuming that all sodium is bound as sodium chloride?

Q. That would be assuming that all sodium is bound as sodium chloride.

A. And OCD has data that says that's not true, as does the industry. I think that when I looked at the sodium chloride portion of the salts, I think that I came up with a percent of 65 percent, something like that, with sodium chloride.

Q. You mean when you looked at data from a pit?

A. When I took a look at the cation and anion data,

the delimited set of cations and anions that were evaluated, it turned out to be, I think, 65-percent -- I may be wrong, but that's my recollection anyway, of sodium chloride. There was sodium carbonate, there was sodium nitrate, there was some calcium chloride, calcium nitrate and so on.

And just looking at the relative proportions of the charges, so that they all balanced out, you know, 65 percent is what I recall for sodium chloride.

Q. Yes, that is in agreement with an earlier statement I said, that sometimes the sodium can outweigh the chloride.

A. Okay.

Q. It can come from other sources.

A. Yeah. Like I say, I don't disagree with you.

Q. Would measurement of the sodium, instead of chloride, be suitable for detecting the presence of a plume that might carry other contaminants? In other words, if you had to chase a plume would you do it by chasing chloride or by chasing sodium?

A. You know, when I'm meeting an environmental program I try to distinguish the plumes separately, because each chemical has its different properties in terms of solubility, absorption of organic material in the soil and so on. So I hesitate to give you just a blanket yes.

Okay?

But certainly sodium has migration properties through soil that -- and as part of the groundwater that, you know, may be a fairly good measure of the extent of potential contamination, the boundaries of the plume. But my preference is not that you do it -- use it for that purpose.

Q. Or is it true the sodium may be stopped by replacing calcium on the soil particles, and so you might find much less sodium than you would find chloride somewhere else?

A. Yeah, quite true --

Q. The chloride --

A. -- quite true.

Q. -- is it not true, is rarely inhibited as it passes through the soil?

A. Not -- that's absolutely true, which is why I would favor this as the unique tracer for the plume.

Q. In a slide of your testimony and also in your report, you said that the new VOC emissions as a result of this rule would be equivalent to twice the currently permitted stationary sources. That was on page 15 of your report. Do those stationary sources include all the gas compressors in the field?

A. Yeah, that statement was actually taken, I think,

from the report that Mr. Pease reported on today.

Q. That and, if I understood you correctly, were other statements regarding general impacts, roads, $CO_2$ emissions and likewise taken from another report?

A. Yes.

Q. Is it not unusual in technical testimony to cite numerical data without reference -- and particularly without reference to published information or traceable information or something that a person can trace backward himself?

A. Hopefully, yes.

Q. Hopefully. So I'm questioning, then, the appropriateness of propagating those numbers through one testimony and another without any backup from the witness.

A. As -- judging from the testimony this morning, so am I.

But the point I was trying to make is that there are alternative consequences of any decision, and the numbers may be too high, they may be too low, but the consequence is going to be there, it's not zero.

DR. NEEPER: Very good. No further questions.

CHAIRMAN FESMIRE: Commissioner Bailey?

EXAMINATION

BY COMMISSIONER BAILEY:

Q. Your slide, What was found? - Halogenated

Compounds, and then you list --

A. Yes.

Q. -- these compounds that were used as QC surrogates --

A. Right.

Q. I looked through the OCD analysis during lunch, and I didn't find any of these compounds in the OCD analysis.

A. Yes.

Q. Did you look through to make sure that they're not there also?

A. I tend to think that these were done by this particular laboratory. Okay, I haven't encountered these before either. That's the reason why we're concerned about, you know, are they real, where do they come from and all that sort of thing that eventually led to discussion with the laboratory.

So it may not surprise me to see that OCD's analytical laboratory didn't use these sorts of QC compounds.

Q. Did you see any compounds in their analyses, the OCD analyses, that would lead you to believe that they were just a different type of QC surrogate?

A. No, not from the data that I saw.

Q. I've been mulling your comments about arsenic,

what was found, arsenic.

A. Yes.

Q. When the Pecos Slope-Abo field was first discovered, the operator could not sell the gas because of the arsenic that was entrained in the natural gas.

A. Yes.

Q. And until they could clean it up at the well site they couldn't sell it to California, because California clearly said, We can't have arsenic in our gas.

But yet you say that arsenic under natural conditions does not pose a threat.

Can you help me reconcile those two apparently conflicting ideas?

A. Yeah. I don't know the full technical explanation, but geothermal conditions are several hundred degrees fahrenheit and high pressure, and in certain situations like that you can perhaps change the nature of the molecule, that you get an arsine gas as opposed to an arsenic vapor, you know, or -- it's not the usual arsenic sulfate-type -- arsenopyrite-type minerals that I'm talking about in the drilling process. Okay?

Deep down, all kinds of strange things can happen, and you actually start to get mercury and other things like that in the gas itself.

Q. Okay, so you're saying to change the essentially

inert arsenic to one that can be toxic to humans, there --

A. Changing it to a form where an inhalation exposure can generate possible toxicity.

Q. Okay. -- would be due to the heat and humidity?

A. That would be my guess. And it's strictly that, a guess. I haven't looked at the formation of inhalable arsenic gas.

Q. But for those pits, for any additional drilling that may be occurring in that particular field, should any other precautions be taken, as far as --

A. I'd actually have to take a look at the data. You know, usually these drilling locations are fairly isolated, which means that the gas will dissipate fairly quickly.

Gases decrease in concentration as the square of distance, so going two units of distance generates a fourfold dilution of the gas concentration, so that by the time it reaches people other than workers, you know, it's going to be fairly dilute. It depends on the resulting concentration and the exposure level to the individual. Okay?

Whether there are occupational concerns is, I think, what you're really asking, because these are the people who are closest to the emission source, the open well or the natural gas, you know, so...

You know, I don't know a whole lot about that particular situation, so I'm just kind of standing in the dark here.

Q. But that type of situation, which is clearly site-specific, would not warrant any specific testing for those drilling muds that may have some of this gas entrained in it for burial on site?

A. My guess is, the gas will be gone. By the time you bury that waste, it's going to be gone.

Q. Just wanted to make sure.

Also, I'm developing a concern that the true believers may believe that we need to start digging up old pit sites because of the evolution of chemicals and additives that have been previously used in drilling muds, like the arsenic in pipe dope that was used up until about 20 years ago or so.

A. Uh-huh.

Q. I'd like to be able to completely waylay any kind of thought that may be coming along those lines.

A. Yeah. All I can tell you is that based upon the data that I've seen -- and it's consistent with the surveys done by the American Petroleum Institute, surveys done by the Environmental Protection Agency and so on, I haven't really seen any constituent that gives me a lot of concern with regard to drilling muds and completion fluids.

I don't know that it would be worthwhile to dig up these things. I'm hedging, because I don't know all the constituents that you're talking about and what's generating the concern.

But it seems to me that once again we're developing how much is there, how are people going to be exposed, to what extent do we need to mitigate the risk that that represents?

Beyond that, I'm not sure that I can give you any hard information. Okay?

COMMISSIONER BAILEY: That's fine. Thank you very much.

THE WITNESS: Thank you.

CHAIRMAN FESMIRE: Since we're going to quit a little bit early today, I need -- I know that Commissioner Olson has a lot of questions, I have a significant number, and then we've got to go back through redirect. I'm assuming there will be some redirect of Dr. Thomas, so...

MR. HISER: Not yet --

CHAIRMAN FESMIRE: Okay.

MR. HISER: -- but there might be after yours and Commissioner Olson's questions.

CHAIRMAN FESMIRE: Okay. So what we're going to do, Dr. Thomas, is go ahead and reschedule you for Friday.

THE WITNESS: For Friday?

CHAIRMAN FESMIRE: And at this time we're going to ask if there's anyone who would like to make a statement on the record.

Ms. Cowan, I know you want to.

Is there anybody else who would like to make a statement on the record today?

Okay. Ms. Cowan, why don't you come forward, please?

Our rules allow you to do one of two things: You can either make a statement of position or you can be sworn and testify on the record.

MS. COWAN: I think I'd like to testify on the record.

CHAIRMAN FESMIRE: Okay, would you raise your right hand and be sworn, please?

(Thereupon, the witness was sworn.)

CHAIRMAN FESMIRE: Ms. Cowan, would you start with your name, please?

CAREN COWAN,

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

DIRECT TESTIMONY

BY MS. COWAN:

MS. COWAN: Mr. Chairman, members of the committee, my name is Caren, C-a-r-e-n, Cowan, C-o-w-a-n.

I'm the executive director of the New Mexico Cattle Growers' Association, and I'd like to thank you for the opportunity to testify before you today on behalf of the association.

Our association has members in all 33 of New Mexico's counties, as well as 14 other states, and our mission is to preserve and protect the beef industry and the private property rights that are necessary for that industry to survive.

Kind of going back, a little bit of history of the involvement of the association in these issues. We've -- back 40 years, the association has been involved in the impacts of oil and gas and energy exploration on private lands. In 2003, specifically with the pit rules, one of our members worked on a pit rule task force or work group, or whatever the title was at that point, and participated in the development of the regulations that were put together at that time.

In 2007, I served on the Governor's pit rule task force along with two others of our members representing the landowner community.

And I'd like to state from the outset that we are not anti-energy. We certainly understand and appreciate the need for a secure domestic energy supply and an economic supply that we can all afford to live on.

But we also believe that there has to be equal protection for land and water and the rights of surface owners, and find some balance as we approach that. And that's what we hope to -- you know, what we had hoped to do on the Governor's task force.

I can assure you that none of us were experts on pit rules. We probably know a lot more now than when we started, after what was -- I can only call a grueling four months, with all due respect. But we're certainly not the experts in the area.

And I will tell you that one of our primary concerns as we watched and worked and participated in rule development is, I hope the Commission looks with caution on how compliance and enforcement can be achieved with regulations. We think that's a key part of what goes on.

But with that said, we are extremely supportive of these regulations, because we do believe that they will protect our state's water supply, provide some rights for surface owners in protecting their land, and protecting the environment as a whole.

Water quality is something that we've discussed a great deal, and actually we asked, as the landowner representatives on the task force, for more stringent regulations as -- relating to water. We thought that additional protections for groundwater up to a depth of 100

feet, rather than 50 feet, was more appropriate.

We're concerned with the future productivity of the land and the ability for the soil to be able to sustain growth once energy development is finished and pits are closed and that sort of thing. Again, we understand we have to have energy, but we've got to balance how we produce that energy with our ability for the land to survive as we move forward.

I was integrally involved with the Surface Owner Protection Act. It was not a bill that came forward from the New Mexico Cattle Growers, but when the bill was introduced and it embodied many of the things that we'd been saying for 40 years, we had no choice but to get involved and become -- and work on the bill.

To my knowledge, I don't believe pit rules were ever contemplated as part of that act. We looked at surface owners' rights and a lot of those other issues, but I just honestly don't recall that pit rules were ever a subject or part of the discussion in any of the drafts in 205, 206 or 207 [*sic*].

The Surface Owner Protection Act passed the Legislature in the House by a vote of 62 to five, with two votes excused; passed the Senate by a vote of 25 to zero. So there was certainly Legislative intent for there to be some protection for the rights of surface owners, as

related to energy exploration.

While I haven't had the ability to sit through this hearing -- and perhaps I'm very fortunate for that -- over the past month --

CHAIRMAN FESMIRE: Is there a second?

(Laughter)

THE WITNESS: -- I have read with great interest a lot of the media reports that have come across, and I see some of the same things in the media.

As we worked on the Surface Owner Protection Act we heard a lot from the oil and gas industry about how those kinds of protections were going to be so costly that it would destroy the oil and gas industry, you know, that we'll all have to pull up stakes and leave.

And given that the Act was only -- began being enforced in July, you know, we haven't seen the full run on that.

But I think that there has to be balance, and economics are important. And we appreciate that the oil and gas industry contributes what it does to our state's economy through taxes and budgeting and through employees. But you have to weigh that with what is the value of our water supply. Can you put a value on what our water supply is worth?

And if we don't take care and not contaminate it

and be sure that we have water for all the generations ahead of us -- we're not here -- We're only here to borrow the land, if you will. It's our responsibility to leave it into the future.

So with that again, the New Mexico Cattle Growers strongly supports these regulations --

Oh, one other item.

I've heard repeatedly that these regulations require the oil and gas industry to go strictly to a closed-loop system. That is not my understanding of what the regulations say. That may be the case in some specific instances due to level of groundwater, proximity to wells, houses, communities, that sort of thing. But I don't read anywhere in the regulations, nor was that a recommendation of the task force that we go to a -- totally to a closed-loop system.

So I hope that you will carefully consider these regulations, I hope you will support them, and we look forward to working with the oil and gas industry and the Commission as these regulations move forward.

CHAIRMAN FESMIRE: Thank you, Ms. Cowan.

THE WITNESS: Thank you.

CHAIRMAN FESMIRE: Are there any questions of this witness from the attorneys?

Ms. Foster?

EXAMINATION

BY MS. FOSTER:

Q. Yes, Ms. Cowan, you represent -- now when you say surface owners, is that people that own private lands, or is that people that are on BLM and state lands as well, in other words, grazing and --

A. All of the above.

Q. Okay. And being as intimately involved with SOPA as I was, you were, SOPA really does require payments from the oil and gas industry to the surface owner for use of that land, correct?

A. It contemplates compensation. That could be payments, that could be any number of things. But it does contemplate compensation, yes.

Q. Okay. But the Surface Owners Protection Act does not give equal protection under the law to a rancher versus an oil and gas -- or a mineral owner?

A. No, that is an issue that --

MR. BROOKS: I'll object to that question. First of all, the word equal protection is a term of law that has to do with the Constitution, so it's not something that's involved in the statute.

And in the second place I think the question -- if -- is just -- means, does it not treat surface owners and mineral owners equally, then it's too vague a question

to give a proper answer to.

CHAIRMAN FESMIRE: I'll sustain the objection.

Would you rephrase your question, please, Ms. Foster?

MS. FOSTER: Well, Mr. Chairman, I'm actually using Ms. Cowan's own words. She used the words, equal protection --

CHAIRMAN FESMIRE: And you as a lawyer have a different responsibility on that. Would you please rephrase the question?

MS. FOSTER: Okay. Well then, Mr. Chairman, might I ask her what she meant by the term equal protection, then?

CHAIRMAN FESMIRE: That would be a valid question.

MS. FOSTER: Okay, thank you, Mr. Chairman.

THE WITNESS: I'm not sure that I said equal protection. I think I said protection and balance.

Q. (By Ms. Foster) Okay. Well then, when you say protection and balance of the mineral owners versus the surface owners, what do you mean by that?

A. At this point -- prior to the Surface Owners Protection Act, there was no requirement for energy exploration companies to give notice prior to going onto private property or to pay any compensation.

Q. Okay. And since you were a member of the task force, I would imagine that you also discussed as part of the task force the increase in trucking that will need to be -- that will need to occur with closed-loop systems, correct?

A. I'm not sure that I remember that specifically, but it would make sense that that was part of the discussion.

Q. Okay. Well, there was testimony -- Were you here for Mr. Chavez's testimony?

A. No.

Q. Okay. Well, he testified that for a typical closed-loop system you have about 100 truckloads on or off of a rancher's land. Are you aware of that?

A. No.

MS. FOSTER: I have no further questions.

CHAIRMAN FESMIRE: Are there any other questions from the attorneys?

MR. BROOKS: I have one.

CHAIRMAN FESMIRE: Mr. Brooks?

EXAMINATION

BY MR. BROOKS:

A. Ms. Cowan, I'm asking this question because Ms. Foster asked you the question about does not the Surface Owner Protection Act require payment of compensation in

certain circumstances?

Does it not also, in addition to that, require that the mineral operator, quote, substantially restore, unquote, the surface?

A. Yes, sir.

MR. BROOKS: Thank you.

CHAIRMAN FESMIRE: Commissioner Bailey?

EXAMINATION

BY COMMISSIONER BAILEY:

Q. Would you and the Cattle Growers support stricter, more clear language for surface restoration and re-vegetation than what is currently proposed in the rule?

A. We -- that was a negotiated compromise, I believe, as part of the task force, and some of that language came directly out of the Surface Owner Protection Act, which again was a negotiated compromise, so we will stand with what we agreed to.

Q. Would you object to stricter or more --

A. We probably wouldn't object. But as I said, a deal is a deal, and we'll -- and we made a deal.

(Laughter)

Q. But I wasn't a part of it.

A. Yes, ma'am.

COMMISSIONER BAILEY: That's all.

CHAIRMAN FESMIRE: Thank you, Commissioner.

Now Ms. Cowan -- Oh, I'm sorry, Commissioner Olson?

EXAMINATION

BY COMMISSIONER OLSON:

Q. Ms. Cowan, you mentioned that the Cattle Growers wanted 100 depth-to-groundwater criteria. I'm assuming that's the siting criteria for burial of waste; is that --

A. It had to do with pits all the way around, not only siting criteria for waste, but in terms of where specific liners would go and that sort of thing. And I honestly probably -- the follow up to that is going to be, What size liner did we want? And I don't remember.

Q. So -- but -- no, I was just thinking, now, was it your -- your criteria, then, you were thinking it should apply -- it should be closed-loop systems under 100 foot to groundwater, or -- ?

A. Correct.

Q. And then there shouldn't be -- I guess conversely, there shouldn't be burial of wastes within 100 feet of water?

A. Correct.

Q. And then was that, I guess, just a compromise, then, looking at the 50-foot criteria? Did the Cattle Growers agree to that?

A. When all was said and done with the pit rule task

force, that seemed to be the best we could do, so...

But we were -- you know, part of the discussion was that we thought it should be at 100 feet. But that was not something that the task force reached any kind of consensus or agreement on.

Q. But you then agree to the consensus of 50 feet --

A. Right.

Q. -- on this?

And just a question, then. You're talking about a long history of involvement with the oilfield industry. How do you know today where old drilling pits are buried?

A. We don't, often don't, and that's some of the concern.

Q. And have ranchers, landowners, I guess, that -- your members, have they encountered drilling pits, whether they're digging a hole or doing different things out on the --

A. I can't think of a specific instance that I could point to, but I -- you know, my gut tells me that that's the case, simply because of the amount of drilling that's gone on in the two corners of the state. But I couldn't give you a specific instance.

Q. But there's no way to tell where a drilling pit is --

A. No --

Q. -- today?

A. No, sir. Other than if there's an area where there may not -- the vegetation may not have come back.

Q. Do you think there should be some way to mark those or somehow designate the location of those --

A. Yes, sir.

Q. -- so people don't disturb them?

A. Right.

COMMISSIONER OLSON: Okay, that's all I have.

EXAMINATION

BY CHAIRMAN FESMIRE:

Q. Ms. Cowan, you served on the task force. Do you remember when the task force met?

A. We started in April, and we participated through August. In August I believe we had mostly conference calls, but we met several days a month in April, May and June.

Q. Okay. And that's of this year?

A. Yes, sir.

Q. And do you remember when the question was asked, what is in the pits?

A. That was asked several times. You know, that was a question that was asked on numerous occasions.

Q. And how was that question answered?

A. We didn't get necessarily when it was first

asked, solid answers, but industry and OCD did testing and came back with some answers. But I don't know that we ever got a full answer. And my recollection is that it varies from pit to pit, so that that would be a very hard question to answer for any specific pit without the operator being there to tell you what was there.

Q. And it was your impression from the statements made by both industry and the OCD that they hadn't done the sampling at that point in time; is that correct?

A. There was sampling going on -- went on during the task force, but there was -- and there was some historical information that Dr. Neeper had. And industry -- OXY came up with some data, and I honestly can't tell you the time frame on the data, but I know there was testing by both OCD and industry as we went along.

Q. During the --

A. -- task force.

Q. -- the summer?

A. Yes.

Q. And there hadn't been any before that, wasn't that the representation?

A. I honestly don't remember, sir.

CHAIRMAN FESMIRE: Okay. I have no further questions.

Is there anything else from the attorneys on that

subject?

MR. BROOKS: No, sir.

CHAIRMAN FESMIRE: Okay. Ms. Cowan, thank you very much.

THE WITNESS: Thank you for taking the time.

CHAIRMAN FESMIRE: With that, we will prepare to adjourn. If the attorneys would stay back just a few minutes, we'll finalize some scheduling issues.

Otherwise, we will adjourn until Thursday morning at nine o'clock in this room.

Thank you all.

(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 4th, 2008.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 16th, 2010