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 XIII - November 30th, 2007

Santa Fe, New Mexico

This matter came on for hearing before the Oil Conservation Commission, MARK E. FESMIRE, Chairman, on Friday, November 30th, 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.

* * *

STEVEN T. BRENNER, CCR
(505) 989-9317

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...)

(Continued...)

(Continued...)

DIVISION WITNESSES (Continued):

* * *

(Continued...)

(Continued...)

(Continued...)

* * *

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

(Continued...)

(Continued...)

PUBLIC COMMENTS:

* * *

(Continued...)

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

(Continued...)

* * *

(Continued...)

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

* * *

(Continued...)

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

* * *

(Continued...)

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

* * *

(Continued...)

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

(Continued...)

* * *

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

(Continued...)

* * *

E X H I B I T S

Applicant's	Identified	Admitted
Exhibit 1	163	163
Exhibit 2	163	163
Exhibit 3	2736	-
Exhibit 4	(58)	205
Exhibit 5	(61)	205
Exhibit 6	(94)	205
Exhibit 7	-	-
Exhibit 8	421	-
Exhibit 9	(373)	399
Exhibit 10	(383)	399
Exhibit 10A	(385)	399
Exhibit 11	(176)	205
Exhibit 12	178	205
Exhibit 13	427	511, 527
Exhibit 13A	430	-
Exhibit 13B	430, 432, 832	834
Exhibit 13C	(345), 433	511
Exhibit 14	428, 449, 511	-
Exhibit 15	449	511
Exhibit 16	457, 459	511
Exhibit 17	450, 458, 484	511
Exhibit 18	484	511
Exhibit 19	676	764
Exhibit 20	677, 764	764
Exhibit 21	679	764
Exhibit 22	-	1159
Exhibit 23	842	1159
Exhibit 24	844, 846, 1109, 1156	1159
Exhibit 25	846, 1157	1159
Exhibit 26	1158	1159

(Continued...)

E X H I B I T S (Continued)

Applicant's (Continued)	Identified	Admitted
Exhibit 27	847, 1158	1159
Exhibit 28	(2551), 2626	2629
Exhibit 29	(2554), 2628	2629
Exhibit 30	2626, 2628	2629
Exhibit 31	(admitted on behalf of OGAP)	
	-	2574
Exhibit 32	2095	2096
Exhibit 33	2138	2160
Exhibit 34 (identical with OGAP Exhibit 11)	2827	-

* * *

Industry	Identified	Admitted
Exhibit 1	1184, 1212	1216
Exhibit 2	1187, 1212	1216
Exhibit 3	1213	1216
Exhibit 10	1213	-

* * *

OGAP	Identified	Admitted
Exhibit 1	1417	1417
Exhibit 2	1489	1490
Exhibit 3	1418, 1420	1486
Exhibit 4	-	-
Exhibit 5	1491	1607
Exhibit 6	1491	1607
Exhibit 7	1491	1607
Exhibit 8	1491	1607
Exhibit 9	1492	1607

* * *

(Continued...)

E X H I B I T S (Continued)

OGAP (Continued)	Identified	Admitted
Exhibit 10	1492	1607
Exhibit 11	1492	1607
Exhibit 12	-	1607

* * *

NMCCAW	Identified	Admitted
Exhibit 1	1757	1861
Exhibit 2	1758	1861
Exhibit 4	1861	1861

* * *

IPANM	Identified	Admitted
Exhibit 1	-	-
Exhibit 2	-	-
Exhibit 3	-	-
Exhibit 4	3074	3176
Exhibit 5	3121	3176
Exhibit 6	(3065)	-
Exhibit 7	(3065)	-
Exhibit 8	3161	3176
Exhibit 9	3164, 3168	3176
Exhibit 10	3170	3176
Exhibit 11	-	-
Exhibit 12	-	-
Exhibit 13	2749	2951
Exhibit 14	-	-
Exhibit 15	-	-
Exhibit 16	-	-
Exhibit 17	-	-
Exhibit 18	-	-

(Continued...)

E X H I B I T S (Continued)

IPANM (Continued)	Identified	Admitted
Exhibit 19	-	-
Exhibit 20	-	-
Exhibit 21	-	-
Exhibit 22	2961	3012
Exhibit 23	-	-
Exhibit 24	-	-
Exhibit 25	-	-
Exhibit 26	-	-
Exhibit 27	-	-
Exhibit 28	-	-
Exhibit 29	-	-
Exhibit 30	-	-
Exhibit 31	-	-
Exhibit 32	3330	3361
Exhibit 33	-	-
Exhibit 34	-	-
Exhibit 35	-	-
Exhibit 36	-	-
Exhibit 37	23	-

* * *

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

FOR THE COMMISSION:

CHERYL BADA
Assistant General Counsel
Energy, Minerals and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

FOR THE DIVISION:

DAVID K. BROOKS, JR.
Assistant General Counsel
Energy, Minerals and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

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:

HOLLAND & HART, L.L.P., and CAMPBELL & CARR
110 N. Guadalupe, Suite 1
P.O. Box 2208
Santa Fe, New Mexico 87504-2208
By: WILLIAM F. CARR

(Continued...)

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

FOR INDEPENDENT PETROLEUM ASSOCIATION OF NEW MEXICO:

KARIN V. FOSTER
Independent Petroleum Association of New Mexico
Director of Governmental Affairs
17 Misty Mesa Ct.
Placitas, NM 87043

FOR CONTROLLED RECOVERY, INC.:

HUFFAKER & MOFFETT, L.L.C.
155 Grant
Santa Fe, New Mexico 87501
P.O. Box 1868
Santa Fe, New Mexico 87504-1868
By: GREGORY D. HUFFAKER, Jr.

FOR NEW MEXICO OIL AND GAS ACCOUNTABILITY PROJECT:

New Mexico Environmental Law Center
1405 Luisa Street, Suite 5
Santa Fe, New Mexico 87505
BY: ERIC JANTZ

* * *

ALSO PRESENT:

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

* * *

WHEREUPON, the following proceedings were had at 9:05 a.m.:

CHAIRMAN FESMIRE: Okay, we're going back on the record.

Let the record reflect that this is the continuation of Case Number 14,015. The date is Friday, November 30th, 2007.

The record should also reflect that Commissioners Bailey, Olson and Fesmire are all present, we therefore have a quorum.

I believe we were in the direct examination of Mr. Tom Mullins by attorney Karin Foster.

Ms. Foster, are you ready to continue that examination?

MS. FOSTER: I believe so, yes. Thank you.

THOMAS E. MULLINS (Continued),

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

DIRECT EXAMINATION (Continued)

BY MS. FOSTER:

Q. Good morning, Mr. Mullins.

A. Good morning.

Q. How are you?

A. Doing well.

Q. Good. Okay, are we ready to continue?

I believe that we left off with -- we were going to introduce Exhibit 8 into -- for discussion, which is on page 8-1 of the IPANM exhibits.

Are you familiar with that exhibit?

A. Are you referring to the exhibit that lists the San Juan River near Bluff, Utah --

Q. Yes.

A. -- at the top?

Yes, I am.

Q. Okay, and did you actually include this exhibit as part of the Synergy operating packet as well?

A. Yes, I did.

Q. Okay, and this was included as part of the IPANM packet as well?

A. That's correct.

Q. Discussing this chart, could you please tell the Commissioners the relevance of this chart as to the -- as it pertains to this area?

A. One of the questions that I asked myself regarding the chlorides, in particular regarding issues in the San Juan Basin, was what the current chloride level would be in the surface waters of the San Juan Basin area.

I was able to find on the Internet, from the Bureau of Reclamation, data on the entire Colorado River system for the western United States. They had on their

website an Excel spreadsheet that tracked the salinity data at numerous locations in the Colorado River basin.

In particular, there were two sites that I was able to identify that were on the San Juan River where data was available, one being on the San Juan River near Bluff, Utah, which is outside of the San Juan Basin, it would be downstream of the San Juan Basin, and then a second site I was able to locate, which was in Archuleta, New Mexico, which is right below the Navajo reservoir area.

The data was difficult to pull out electronically, it was all in a PDF format at the Archuleta, New Mexico, location, and I was unable to present that. I do have that information available to discuss if we would like to discuss that.

But this particular exhibit reflects the salinity data -- not total dissolved solids; it is salinity -- for the San Juan River near Bluff, Utah.

On the Y axis, on the left-hand side, is the total dissolved salts in milligrams per liter. On the right-hand portion of the axis is the flow rate in acre-feet.

Analyzing the chart, you can identify that at the higher flow rates in the river the salinity is decreased. And I believe that function occurs on all of the sites in the Colorado River Basin.

On the X axis, along the bottom, the data is from 1940 until current, 2007.

The average salinity data on the San Juan river near Bluff, Utah, based on my analysis, was I believe 441 milligrams per liter.

And so I looked at that, and I was trying to compare that with the groundwater standard of 250 milligrams per liter. And it just surprised me, and I thought it might surprise the Commission, to see that the river salinity was higher than the concentration that we're proposing in -- or excuse me, that the Oil Conservation Division has proposed for the rule.

Q. Okay. And does the San Juan River run through the San Juan Basin?

A. Yes, it does.

Q. Okay, and in fact it runs through the City of Farmington, does it not?

A. Yes, it does.

Q. And are there any oil and gas locations near the San Juan River?

A. Yes, there are.

Q. And now how does this relate, this 441 milligrams per liter, to, for example, the paint-filter test and the landfill standard?

A. Well, this would be a liquid reading. I guess it

would be comparable to the leachate. So the leachate of 441 on average would be a comparison analysis, with the SPLP method that's been discussed in the rule.

Q. Okay. All right, moving on to Exhibit -- Exhibit 9, which is a USGS report, did you submit that report as part of your Synergy Operating data?

A. Yes, I did.

Q. And it is also included as part of the IPANM exhibits?

A. That's correct.

Q. All right, and are you familiar with this full report?

A. Yes, I am.

Q. Have you actually read this report and analyzed it?

A. Yes, I have.

Q. And how is this -- what does this report tell us?

A. What --

MR. JANTZ: Excuse me, Mr. Chairman, I have to object to this line of questioning and this exhibit.

Mr. Mullins was qualified as a petroleum engineer, not a hydrologist or a soil scientist, and my reading of this report is that it deals with the transport of contaminants due to on-site burial.

CHAIRMAN FESMIRE: Mr. Brooks?

MR. BROOKS: Division joins in that objection.

CHAIRMAN FESMIRE: Ms. Foster?

MS. FOSTER: Well, Mr. Commissioner, our position would be that, yes, Mr. Mullins is an expert as a petroleum engineer. However, he did testify that in his capacity at Synergy Operating he does have to look at every single facet of operations, and migration through soils would be one of the issues that he has to be aware of, and hydrology is one of the issues that he also has to be aware of and knowledgeable on as a small operator.

CHAIRMAN FESMIRE: Okay, so could you qualify him as an expert in hydrology?

MS. FOSTER: Well, maybe I should ask the witness if he feels comfortable being qualified as an expert in hydrology.

CHAIRMAN FESMIRE: Okay.

THE WITNESS: Yes, I believe, I guess in answer to the question, that I'm qualified to discuss this, and I believe that it's pertinent to the Commission's attention, primarily because it discusses the flow of groundwater -- or, excuse me, the flow of water through the vadose zone, in particular in an arid environment.

I spent a great deal of time researching information to present to the Commission that would be relevant, and I believe I'm capable of discussing the

movement of water through -- and gases, through the pore space. I believe that's what I've done my entire career.

CHAIRMAN FESMIRE: Ms. Foster, why don't you go ahead and qualify him as an expert in hydrology, then?

MS. FOSTER: Okay. Should I just make that request on the record, Mr. Chairman, or should I specifically ask him his educational background in hydrology?

CHAIRMAN FESMIRE: Education, qualifications and why he's qualified to speak as an expert on vadose-zone hydrology issues.

MS. FOSTER: Okay, thank you, Mr. Chairman.

Q. (By Ms. Foster) Mr. Mullins, in your training as a petroleum engineer, did you have any academic classes or any discussions relevant to the issue of hydrology as part of your training?

A. Yes, I have. In fact, I worked -- in addition to my regular classes as a petroleum engineer, I also worked at the Colorado School of Mines in the graduate department, and I worked, in particular, with a device called a minipermeameter, which is utilized to discuss or present fluid flow in both -- primarily in air, as the minipermeameter tool, flow through core media and then particular materials or soil samples that are difficult to place into an actual core holding cell. Or you can run

multiple pore volumes through that material to determine residual saturation percentages.

So I've done that work at the graduate level at the Colorado School of Mines.

In relation to the matter at hand, I've worked in the San Juan Basin, discussing flow of oil and gas and water through the pore spaces in northwest New Mexico. I've also worked in the Paradox Basin and in Wyoming.

Q. Now Mr. Mullins, it's also my understanding that you were also a consultant to several small and large oil and gas companies in the San Juan Basin?

A. Yes, that's correct.

Q. And your expertise in hydrology as well as petroleum engineering, does that come into play in your work for the larger corporations in the San Juan Basin?

A. Yes, it does.

MS. FOSTER: At this time, I would request that Mr. Mullins be considered an expert in the field of hydrology.

CHAIRMAN FESMIRE: Okay, is there any objection to that?

MR. JANTZ: I object. The witness hasn't demonstrated, other than dealing with one program in graduate school and a general assertion that he's a consultant for large companies, that he has any significant

background or experience in hydrology or hydrogeology or soil science.

CHAIRMAN FESMIRE: Okay. Well, Mr. Jantz, at the level this hearing is being held, I think he's identified enough of an expertise for the Commission to at least hear his evidence. Your arguments will be considered on the credibility and viability of his testimony.

MR. JANTZ: Thank you, Mr. Chairman.

CHAIRMAN FESMIRE: Ms. Foster, please proceed.

MS. FOSTER: Thank you.

Q. (By Ms. Foster) Mr. Mullins, have you read what has been considered -- notated as Exhibit Number 9 in the IPANM exhibit, the Waste Burial in Arid Environments document?

A. Yes, I have.

Q. And how does the Waste Burial in Arid Environments document pertain to the issue at hand, the pit hearing before the oil and gas commission?

A. Well, I believe this is relevant for the Commission to be aware of this reference item. It is prepared by the United States Geological Survey, and it deals in particular with a location in Nevada, which is an arid environment. And what the USGS has been modeling in this particular area is the effect of fluid migration through the near-surface area, specifically regarding

precipitation. The paper discusses disturbance areas, as well as natural infiltration rates in an arid environment.

There is very -- excuse me, there are very few real-world examples. This particular case is being continuously monitored. It identified a couple of factors that have been discussed previously in the testimony, one being that in a -- that there is salt migration upward towards the surface. I believe that was discussed in Dr. Neeper's testimony. Specifically in an arid environment, fluid movement can be in the upward direction towards the surface.

It also discusses a few figures on infiltration depths. I guess one of the important conclusions was listed that it took approximately 16,000 years for deep percolation, which is the movement of water downward, and in this particular area it went down about 30 feet for the 16,000-year level. They used some different techniques to measure that infiltration.

So basically it indicates that in an arid environment it does take quite a long period of time, which I believe is consistent with Dr. Stephens' testimony and the other references that were offered.

Q. Now Mr. Mullins, directing your attention to page 2 of your document, the paragraph that begins just before the -- what has been delineated as Figure 4, does this

discuss the different factors that must be considered when doing some modeling of water movement through unsaturated zones?

A. Yes, it does.

Q. And which factors are highlighted in this document as must be considered?

A. I'm referencing the paragraph right above the picture, which is Figure 4, and it indicates that, Water movement in the unsaturated zone is very complex. Several -- there are several variables -- water content, water potential, humidity and temperature must be monitored to define rates and the direction of water movement.

Q. Okay. Now, is that consistent with your prior testimony concerning Mr. Hansen's model?

A. Yes, it is.

Q. And then moving on to the API report, which is marked as Exhibit 10 for the Independent Petroleum Exhibit --

A. Yes.

Q. -- which I believe I gave copies to the Commission on the last day that we met, this -- this -- how is this document relevant to the instant -- the hearing that we have at hand? This is a Soil and Groundwater Research Bulletin issued by API.

A. Yes, this is relevant to the Commission, I

believe, regarding some of the organic constituents --

CHAIRMAN FESMIRE: Ms. Foster, I misplaced mine. Do you have another copy?

MS. FOSTER: Certainly. May I approach?

CHAIRMAN FESMIRE: You may, ma'am.

MS. FOSTER: I have additional copies if anybody would like these also.

COMMISSIONER OLSON: I'll take one too.

MS. FOSTER: And Mr. Chairman, this was included as Exhibit 10 in our original exhibits. However, I was notified by Dr. Neeper that it did not get copied onto our CD by -- by basically an oversight, so I did provide it by e-mail to all the attorneys and provided them after a break last -- at the end of the day the last time that we met.

Q. (By Ms. Foster) Again, concerning the hearing that we have here today, Mr. Mullins, this document discusses mobility limits in soil?

A. Yes, that's correct.

Q. Okay, and how is that relevant to the instance that we're here for?

A. I believe this is relevant for the Commission to consider, primarily because we've discussing chlorides as the identifier for movement of contaminants. The testing that the Oil Conservation Division performed indicated that there were a presence of nonaqueous-phase liquids. To just

use a simplified term on that, would be some hydrocarbons.

This particular paper prepared by the American Petroleum Institute identifies screening criteria from soil sampling on what would be identified to be mobile constituents that would be nonaqueous-phase liquids, and for this particular discussion I'd probably focus on, let's say, diesel- or gasoline-range hydrocarbons.

This screening document, I believe, would give the Commission as well as the OCD a screening threshold for the mobility of that phase of contaminants.

Q. Okay. So then are you saying that there are constituents in drilling pits that we've been discussing at this hearing, correct?

A. Yes, that's correct.

Q. And are you saying that based on this document, not all of those constituents would be mobile?

A. That's correct, based upon the information that's in this paper, specifically referencing on page -- excuse me, page 5 of the exhibit, which is Table 2. This table is a summary of the residual concentrations in soil of nonaqueous-phase liquids.

If you look over on the far column, there's an item listed as C_{sat} soil, which is the saturation level in soil in milligrams per kilogram.

The column just to the left of that is $C_{residual}$

soil, and it's also listed in milligrams per kilogram.

These two columns can be utilized as screening criteria for the mobility of hydrocarbons, and as you move down the left-hand column, there are a number of different types of constituents from gasoline, distillates, fuel oil, heavy fuel oil, mineral, diesel, xylene -- a number of different constituents on their mobility.

The reason this table, I believe, would be useful is, you could compare these readings in sampling material to identify if it would be mobile.

I believe in our particular case in northwest New Mexico, the sampling which was taken on the soils was directly out of the pits. There was no stabilization or any type of additional remediation done. And I believe once you take those samples from the reserve pit and they're stabilized, utilizing the screening criteria would indicate that those constituents would not be mobile. That's what I believe this document indicates.

Q. Okay. And based on your review of all these documents and your experience, what in your professional opinion should be your recommendation to the oil and gas conservation commission pertaining to Rule 17?

A. With regard to Rule 17, I believe my original statement that -- I believe the current rule, Rule 50, is adequate to protect the groundwater and the public health

and the environment.

But if there is a -- if it is believed to be necessary to rewrite the rule, the -- this particular reference item would indicate that even residual hydrocarbons that might be present within a reserve pit would not be mobile. And so the testing criteria of testing beneath the pit in northwest New Mexico, I don't believe, would be warranted for these constituents, based upon the saturation levels that have been found in testing.

You could actually probably test in the pit, as was done by the OCD, rather than underneath the pit, to identify these levels.

Q. And currently, your pits in northwest New Mexico, your drilling pits, are those lined?

A. Yes, they are.

Q. Okay, so you have this non-mobility factor plus a lined pit?

A. That's correct.

Q. And that is what is left in place, should you do your -- what you've described as a taco closure, as opposed to the burrito closure?

A. Yes, that's correct. The -- I did -- That's correct.

MS. FOSTER: Okay. Mr. Chairman, at this time I would move Exhibits 4, 5, 8, 9 and 10 that were presented

by the Independent Petroleum Association into evidence for further discussion.

CHAIRMAN FESMIRE: Okay, and you're deliberately excluding 6?

MS. FOSTER: Yes.

CHAIRMAN FESMIRE: Any objection to the admissions of 4 through 10, excluding 6?

MR. BROOKS: I believe that she also excludes the 7.

CHAIRMAN FESMIRE: Oh, I'm sorry.

MS. FOSTER: Yes.

MR. BROOKS: No objection, your Honor.

MS. FOSTER: For the record, Exhibits 6 and 7 were MSDS sheets that Mr. Mullins did include as part of his packet of information under the Synergy Operating banner that was presented separately, just in writing, to the Commission, and then we included this as well, as part of our exhibits, should the Commission want to review specific MSDS sheets.

CHAIRMAN FESMIRE: Okay. Mr. Carr, I assume you have no objection?

MR. CARR: I have no objection.

CHAIRMAN FESMIRE: Mr. Jantz?

MR. JANTZ: Other than the previously raised objection with respect to Exhibit 9, I'd like to raise that

same objection with respect to Exhibit 10. Otherwise no.

CHAIRMAN FESMIRE: Okay, your objections are noted and overruled.

Mr. Huffaker?

MR. HUFFAKER: No objections.

CHAIRMAN FESMIRE: Exhibits 4, 5, 8, 9 and 10 are admitted.

MS. FOSTER: Yes, thank you, sir. And at this time I would pass the witness.

CHAIRMAN FESMIRE: Mr. Carr, do you have any questions of the witness?

MR. CARR: No questions, Mr. Chairman.

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

MR. JANTZ: A few, yes.

CHAIRMAN FESMIRE: Why don't you come up and sit at the table?

CROSS-EXAMINATION

BY MR. JANTZ:

Q. Good morning, Mr. Mullins.

A. Good morning.

Q. I'm Eric Jantz, I'm an attorney with the New Mexico Environmental Law Center. I'm here representing the Oil and Gas Accountability Project.

I just want to take a quick review of the cost

estimates that you've presented to the Commission. I think it was Exhibit 4.

A. Yes. If you'll give me a minute I'll --

Q. Certainly.

A. -- pull that out.

Exhibit 4 is my calculation sheet regarding waste calculations and cost calculations.

Q. Okay. Is there -- do you have anywhere on here the percentage that these waste costs -- Well, let me ask you this.

Did you calculate how much the waste costs are as a percentage of revenues for your company?

A. Did I calculate -- I want to make sure I understand your question.

Q. Sure, sure.

A. Did I calculate the waste costs --

Q. -- as a percentage of your revenue?

A. -- as a percentage of the revenues of our company? No.

Q. No, you didn't. Okay.

Do you have an estimate of how much they might be?

A. Well, they would be significant based upon the information that I have indicated here. The thirty -- the $35,000 increase --

Q. Okay.

A. -- is basically a 30-percent increase in the drilling cost of one well.

Q. Right. And over the life of that well do you have a sense of how much that might be in terms of a percentage?

A. I do not.

Q. You don't, okay.

Let's see. Okay, you priced the closed-loop system at $400,000; is that right? Is that what you testified to?

A. Yes, that's what I testified to.

Q. Okay, and that's to buy it, not to rent it?

A. That is correct.

Q. Okay. But renting it would presumably be a cheaper option, would it not?

A. Not necessarily.

Q. And why do you say that?

A. Well, there are really several factors that relate to closed-loop systems. I testified about availability --

Q. Uh-huh.

A. -- I testified about the costs. There's a supply and demand function on that piece of equipment. Obviously, the greater demand, the higher the cost.

Q. Sure. But it's safe to assume, though, I think, that, based on the other testimony we've heard, rental costs are somewhere between fifteen and $2000 per day -- or $1500 and $2000 per day, that it would take a pretty high demand to get you to $400K over the 30-day drilling period, or 60-day drilling period.

A. I don't believe your costs are correct. I believe they're significantly higher than what you've stated in your question.

Q. In what sense? In terms of renting?

A. Correct.

Q. So you disagree with all the witnesses who've placed the closed-loop rentals at $1500 to $2000 a day?

A. I disagree with your statement on the question of the amount being $1000 to $1500 a day. I believe the figure that was utilized in the testimony was significantly higher than that.

Q. And do you remember what that was?

A. I do.

Q. And that was -- ?

A. It was $5000 a day for the estimates that Mr. Springer had presented in the Yates Petroleum testimony.

I also have personal experience running the equipment, and that figure is consistent, and that was the cost item that I used on this particular exhibit --

Q. Okay, let's --
A. -- that you're asking me about.
Q. -- let's assume $5000 a day, then. It's still going to take a pretty high demand to get you to $400K for a 30- to 60-day drilling period, is it not?
A. It's going to be expensive if that equipment was available, yes.
Q. Okay. You took issue, did you not, with Mr. Hansen's modeling?
A. I have some concerns with Mr. Hansen's modeling, specifically with regard to northwest New Mexico.
Q. And it was my understanding -- and correct me if I'm wrong about this understanding -- is that his choice of Dulce, New Mexico, as sort of the anchor point for his modeling was inaccurate; is that right?
A. I do not believe that Dulce, New Mexico, is representative of the San Juan Basin.
Q. Because the growing season is different?
A. It is.
Q. Solar radiation factors are different?
A. That's correct.
Q. Precipitation and vegetation is different?
A. Yes.
Q. In your Exhibit 9, the USGS report regarding contaminant transport, that report took place in the Mojave

Desert, did it not?

A. That's correct.

Q. Near Nevada -- Bennett, Nevada, I think, is the city that it said; is that right?

A. Yes, the test site is located in the State of Nevada.

Q. Right, okay. And you believe that the Mojave Desert represents a closer -- a closer analogue to the San Juan Basin than Dulce, New Mexico?

A. No, I believe I stated that this paper in particular dealt with salt movement in an upward direction, in an arid environment. It also dealt with the movement of contaminants, that being primarily salt in this instance, in an arid environment which is similar to many areas of the San Juan Basin.

Q. But doesn't precipitation affect contaminant movement?

A. Yes, it does.

Q. Doesn't soil type affect contaminant movement?

A. Yes, it does.

MR. JANTZ: Thank you. I think that's all I have.

CHAIRMAN FESMIRE: Mr. Huffaker?

MR. HUFFAKER: Nothing, Mr. Chairman.

CHAIRMAN FESMIRE: Mr. Brooks?

MR. BROOKS: Shuttle again. As time goes on, I get better.

CHAIRMAN FESMIRE: And early in the day.

THE WITNESS: May I ask for some assistance with the computer to get it -- if we're going to be referring to the exhibits, because it has taken a pause in its operation.

CHAIRMAN FESMIRE: Okay. Why don't you see if --

MR. BROOKS: I don't know that we're going to be referring to that many exhibits, and I think we have the paper copies available.

CHAIRMAN FESMIRE: But in the meantime, Mr. Price, would you see if somebody is available to get the computer back working --

MR. PRICE: Oh, okay.

CHAIRMAN FESMIRE: -- in case we do need it?

Okay, why don't you go ahead.

THE WITNESS: I just wanted to reference that for the speed of the Commission in answering these questions.

MR. BYROM: It was off, it's going to have to boot up.

MR. PRICE: It's on.

MR. BYROM: Okay, there we go. Can you tell me your password?

THE WITNESS: I think that's what I was getting at.

CHAIRMAN FESMIRE: Around here that's a mortal sin.

Before you start, Mr. Carr, did we ever find our missing attorney?

MR. CARR: Mr. Hiser?

CHAIRMAN FESMIRE: Yeah.

MS. FOSTER: He's home sick.

MR. CARR: Mr. Hiser has had the flu this week, and he is home sick, and I am hoping he recovers --

(Laughter)

MS. FOSTER: We actually made a comment to him that if he doesn't come back, we're going to finish all the M&Ms, which are not --

(Laughter)

CHAIRMAN FESMIRE: Mr. Brooks, you don't object to Mr. Carr's comment that they're hoping that he recovers soon, do you?

MR. BROOKS: Well, I would hope that he recovers soon after this proceeding is --

(Laughter)

MR. CARR: We'll convey your sentiments.

(Laughter)

CHAIRMAN FESMIRE: And your heartfelt concern.

CROSS-EXAMINATION

BY MR. BROOKS:

Q. Good morning, Mr. Mullins.

A. Good morning.

Q. Mr. Mullins, your experience is primarily as a petroleum engineer, correct?

A. That's correct, that's correct.

Q. And you have testified in this case about groundwater hydrology and vadose-zone hydrology, soil physics, which is Mr. -- Dr. Neeper's specialty. But these are not things that you have studied intensively; is that correct?

A. I have studied the modeling. As soon as the models were presented and information that I had available to analyze, I studied the models that were utilized by the Oil Conservation Division.

Q. How much experience do you have working with those models?

A. A limited amount of experience.

Q. How limited?

A. Basically confined to the case at hand.

Q. Thank you. I'm going to be going back to the models, but I think I will begin by asking you some questions about Exhibit Number 4, which is the exhibit -- that's where you discussed costs.

A. Yes.

MR. BROOKS: I wish you'd gotten a printer that printed a little bigger type.

(Laughter)

MR. BROOKS: I'll manage the best I can. Getting close to 60 years old, it's hard to see exhibits like this.

(Laughter)

CHAIRMAN FESMIRE: David says he's getting close. He didn't tell you that it's -- never --

(Laughter)

MR. CARR: Every day not so close?

(Laughter)

Q. (By Mr. Brooks) It looks to me like the first thing you did in these two tables in the left-hand column was to compute hole volume, correct?

A. That's correct.

Q. And then you multiplied your hole volume times a multiplier. You say multiplier wastes, 10 times. Correct?

A. That's correct.

Q. Now is that the total waste stream, or is that the solids only?

A. That's the solids only.

Q. Okay, and that was the same -- Were you here when Mr. Small testified?

A. I was here.

Q. And so that 10 multiplier for the solids, that's the same number Mr. Small used, right?

A. I don't believe that's correct.

Q. Well, the record will speak for itself on that.

Have you studied the Rogers paper -- Rogers, *et al.*, paper --

A. Yes, I have

Q. -- on closed-loop systems?

A. Yes, I have.

Q. And does that paper suggest that a figure at around four times hole volume would be more accurate for a closed-loop system?

A. The Rogers paper refers to a theoretical efficiency level of the closed-loop system being approximately 80 percent, and in that efficiency level it would be determined a hole volume ratio of solid waste of approximately -- I think it was 4.6 or 4.7 times the hole volume.

Q. Correct. And if you had used 4.6 times the hole volume, you would have gotten a much smaller cost estimate here, would you not?

A. If I had a closed-loop system on my shallow Fruitland Coal well that doesn't have any solids equipment other than the reserve pit, I would have a lower figure. But to state that it would be 4.6, I couldn't say.

Q. But anyway, if you had a figure in that range, that would substantially reduce both your trucking of solids, $8000 figure, and your solid waste charges of $2800, correct?

A. I'm assuming you're giving me a hypothetical.

Q. I am, yes, sir.

A. In this hypothetical example, if I were to reduce the solid waste from a factor of 10 to a factor of 5, approximately --

Q. Yeah.

A. -- and assume your theoretical --

Q. Yes, sir.

A. -- it would reduce the number of trucks by half. For the solids, instead of eight trucks I would have four trucks in this particular case. But the solids equipment costs would not change.

Q. No, but the solid waste charges from landfill would also be less, would they not?

A. Yes, they would.

Q. By about half?

A. Theoretically.

Q. Okay. Now let me ask you about this item, backhoe loader with operator. Is that to -- the first one that appears on your table that's in the box, is that for a backhoe loader to remove the drying-pad contents?

A. Well, I don't have a drying pad in this particular instance, I have a shallow reserve pit. So in this particular portio of the costs, the backhoe or loader with an operator would be the physical piece of equipment, along with the labor to remove the solid materials and place them into a truck.

Q. Now, if you were using a conventional closure, would you not need a backhoe with an operator to stabilize and backfill the pit?

A. Not at this particular time, no. This is strictly an incremental difference.

Q. Yes, but that's why I'm asking you this question, because by removing the waste in this manner, do you -- while you incur the charge of having a backhoe come out and remove the waste, don't you also save the charge that you would otherwise have to pay to stabilize and backfill the pit?

A. I don't believe so, because you still have to remove all the liner material that is placed at the well site. So my $1500 cost that I've estimated strictly deals with the additional expenditures that would be related to removal of the solids on a wellsite. Not any additional phase of closure, that's all separated from my calculations.

Q. So you're saying your $1500 is derived from

taking the total amount that the operator and backhoe would charge and deducting it -- from that, the amount that would have to be charged if you did a conventional closure?

A. I believe you're asking me the question, how did I come up with the $1500 charge for the backhoe loader with operator?

Q. Well, what I'm understanding is that -- what I'm trying to understand is, in getting to an incremental charge did you allow for the backhoe charges that you would save by this operation, as well as the ones that you incur?

A. No, because I don't see any savings of cost. This $1500 on that line item, it basically takes us three days to drill the well. We would have to have a backhoe operator present to remove the cuttings material while we're doing the work, and that's -- I estimated that at approximately $500 per day for the labor and the piece of equipment.

Q. Okay. Well, I'll ask you the same question then about the next item below the subtotal where you have the Mob/Demob/Backhoe (Combined). What is that item?

A. Yes, those two line items on my exhibit relate to the completion phase of the operation. Typically we do not complete the well at the exact same time that we drill the well, so there would be a separate mobilization charge to haul the backhoe equipment from Farmington down to the

actual site, perform the actual operational work related to the completion activity, and then to demobilize that equipment and take it back to Farmington.

Q. The -- Where did you compute the amount of trucking solids for your completion phase? I don't see another computation of solids on here.

A. You're right, I left off the additional cost related to the solids from the completion phase. My calculation would actually be higher than what's represented. Thank you for pointing that out.

Q. Why would it be higher if -- you already have a $2000 item in there, that's what -- the one that -- I don't see where you computed it.

A. Well, the line item that is basically missing is the waste charge calculation at $18 a yard. That line item of $2800 would be solid waste charges from landfill, which was up in the drilling phase of the operation. There would actually be that line item in the completion phase of the operation that I inadvertently left off.

Q. Well, how did you calculate the two trucks for the completion operation?

A. I believe that -- from my experience on the completion phase, we have to remove under -- removing all of the solids from the well site, and in this particular instance this would be the frac sand and the related

material that would basically occur in some sort of flowback tank, and I'm factoring in cleaning that material and placing it into a truck and hauling that equipment back to Farmington.

Q. Isn't this -- So this is frac material, from the frac?

A. Yes, this is completion -- the completion solids, is what this would be.

Q. And what would you do with that material in a conventional operation?

A. In a conventional operation, completion materials such as cement or frac sand, quartz, would be placed into the reserve pit, the lined reserve pit, and closed in place.

Q. Which you would have to stabilize and backfill?

A. Which you would have to close under the proper procedure, yes.

Q. Thank you. Well, let's go back to the model and talk about the modeling procedure.

Was it your testimony that the mixing zone is one of the more important parameters on using the MULTIMED model?

A. On the MULTIMED model, the mixing zone is in the aquifer portion or the bottom portion of the model.

Q. Correct.

A. And it is important.

Q. Now, for those of us in the room -- doesn't include the Commissioners, no doubt, but there are some of us who are only lawyers -- see if we can figure out what we're talking about when we talk about the mixing zone.

As I understand it, an aquifer has a certain thickness. It may be hard to determine, but theoretically at least it has a certain thickness.

MR. PRICE: May we approach to put that slide up?

MR. BROOKS: That's fine with me, that's a good idea. You may ask the Commission.

THE WITNESS: Is there a question? I'm sorry --

CHAIRMAN FESMIRE: Hang on just a second.

MR. PRICE: Commissioner, may we approach and put the slide up with the mixing zone so everyone can see it?

CHAIRMAN FESMIRE: You may. Is that relevant to the cross-examination of this witness?

MR. BROOKS: It is, that's -- this is the concept I'm trying to get him to explain.

CHAIRMAN FESMIRE: Okay. Off of an exhibit that isn't his?

MR. BROOKS: Where did this -- Which exhibit is this from?

MS. FOSTER: I believe the exhibit was -- came in through Mr. van Gonten and is in evidence, and Mr. Mullins

will be ready to speak to it.

MR. BROOKS: It is, I think, in evidence, but I wasn't sure where in evidence --

MR. PRICE: Do you know which exhibit? If it would help people understand what the...

MS. FOSTER: Maybe it's Mr. Hansen.

MR. BROOKS: Oh, okay. I'm informed that -- reliably informed now that this is not in evidence, Mr. Chairman. I'm wondering if we can use it as a demonstrative aid for the purpose of having the witness explain the concept?

CHAIRMAN FESMIRE: Ms. Foster -- Why don't we have her put it up, and then you can respond with the other objection.

MS. FOSTER: As an attorney, it looks fine to me, but --

(Laughter)

MS. FOSTER: -- that's not saying much.

CHAIRMAN FESMIRE: Okay, the record will record that there was not an objection, and the exhibit can be used as a demonstrative exhibit.

Mr. Brooks, do you happen to have copies of that?

MR. BROOKS: I only have the one, but I'll be glad to --

MR. PRICE: We'll make copies.

MR. BROOKS: -- print these up. We can send Mr. Price --

(Laughter)

MR. BROOKS: -- I get to send my client on errands, so we can send Mr. Price to make copies, which he delegated to another individual.

CHAIRMAN FESMIRE: As a former criminal attorney I tried to do that a couple of times, but it didn't work.

(Laughter)

MR. BROOKS: I can imagine.

CHAIRMAN FESMIRE: People like Ms. Foster wouldn't let me.

MR. BROOKS: May Mr. Price approach to give the witness a pointer?

CHAIRMAN FESMIRE: He may.

Q. (By Mr. Brooks) The question I was asking you before Mr. Price raised the issue about the exhibit is that an aquifer has a certain total thickness, and that would be, I believe, what's depicted by the arrows with the indication that looks like a B to me, there on the right-hand side of the upper diagram; is that correct?

A. I see the item B in the upper drawing, yes.

Q. Does that refer to the aquifer thickness?

A. It appears to refer to the aquifer thickness in this particular drawing.

Q. Now the concept of mixing zone, I believe, is that when contaminants enter the aquifer they will diffuse through some part of, but not necessarily the entire thickness of the aquifer, because they're being simultaneously being carried downstream by the current. Is that an accurate assessment?

A. Well, let me do my best to answer your question. Dr. Neeper gave an excellent analogy with regard to how brine water diffuses the visual. He utilized a colored liquid, basically placing a brine water with a dye color in it, and it distributed itself, I believe over a two-day period of time, in the remaining portion of the liquid as a visual.

In our particular instance, we're dealing with time scales of years and flow rates in millimeters, so I believe that the mixing would be rather thorough with regard to this particular analogy.

So the mixing zone, which is referenced as the big H --

Q. Yeah.

A. -- in this particular drawing would likely be almost equivalent to B, the entire aquifer, which I believe is what Dr. Stephens testified to.

Q. Well, I actually wasn't asking you at this point about the validity of the -- about the validity of the

scale as depicted there. I was really just asking you to explain the concept of mixing zone.

And as I understand the concept, is that there will be a sweep because the contaminants are being -- are moving down the gradient at the same time that they're moving down into the waste.

A. That's correct. But in Mr. Hansen's model he utilized a test well.

CHAIRMAN FESMIRE: Mr. Brooks, will you have a copy for the Commission?

MR. BROOKS: May Chief Price approach?

CHAIRMAN FESMIRE: He may, sir.

THE WITNESS: My apologies. In Mr. Hansen's model, his monitoring well which is shown in the diagram on the upper part --

Q. (By Mr. Brooks) Right.

A. -- is basically right next to the pit.

Q. Well, it's one meter downstream, is it not?

A. I believe so. We'd have to look at the exact exhibit, which is Exhibit 20, and we can go through that and look at that.

Q. Well, I actually at this point didn't ask you anything about what Mr. Hansen did, I just asked you about the concept of mixing zone. And I think we've got it explained.

Other than possibly the scale of the different -- of the relative size of H and B, is there anything on that upper diagram that you disagree with?

A. Well, to describe that diagram a little further, the item V appears to be the aquifer transport support flowing -- that's what's pushing the mixing zone in the direction that you can see. But there's nothing in particular in this, other than it's missing the vegetative cover that should be on top of the waste facility in this particular picture.

Q. That's not relevant to the mixing zone, is it, though?

A. Well, I believe it's relevant to the contaminant that might move down to the mixing zone level.

Q. Well, that's -- My question was, it's not relevant to the mixing zone, other than insofar as the quantity of contaminant might determine what was an appropriate mixing zone?

A. I guess there wouldn't be a mixing zone if the contaminant didn't move down to the mixing zone.

Q. If the contaminant movement were zero, there'd be no mixing zone, so --

A. That's correct.

Q. Okay. Now you told us that Dr. Stephens used the entire thickness of the aquifer, or 50 feet, which was his

assumed thickness. It wasn't an actual aquifer, right? He was postulating a 50-foot aquifer, right?

A. That's what I recall, but I don't have his exhibits right in front of me.

Q. And he used a 50-foot mixing zone?

A. That's what I recall. Excuse me, I'm not sure if it was meters or feet. I'd have to refer to the actual exhibit.

Q. And did you -- if my notes are correct, you said that you thought maybe that was too high?

A. Well, I -- what I stated was that the OCD presented a 4-inch mixing zone, or basically they used .1 meters in Mr. Hansen's model, and -- for a 50-foot aquifer. And I believe that I stated that if you increase that mixing zone depth from 4 inches to potentially 1-foot level, for instance, it would dramatically reduce the concentration of contaminant that would be placed in the aquifer. I believe that's what I stated.

Q. Regardless of that -- and let's talk about that 4-inch assumption for a minute. You said your experience dealing with the MULTIMED model was essentially limited to this -- or did you say it was entirely limited to this project?

A. I believe I stated that I became aware of which model the OCD was utilizing, and then I became familiar

with the MULTIMED model and the HELP model in order to offer some assistance to the Commission in interpreting the data.

Q. And have you run a model on this MULTIMED model?

A. You know, that's an interesting question. I've attempted to. Unfortunately, I've been in the hearing continuously. I have most of the input parameters placed in there, but I have not actually run and duplicated Mr. Hansen's model.

Q. Are you aware that the MULTIMED has two alternatives with regard to the mixing zone? You can either -- you can either direct it to -- you can either enter a mixing zone figure, or you can direct the model to derive?

A. Yes, I am aware of that.

Q. And are you aware how the -- using the derive function, how the model handles that in its output printout?

A. I am, yes.

Q. And does it not print out a default value of .1 meter, rather than the value that it actually computes?

A. It can, yes. There's also two versions of this. This is the DOS-based version of the MULTIMED model. They have a Windows-based version of the model also.

Q. But you said it can print out, as you said --

A. Yeah.

Q. -- .1 as a default value?

A. Referencing page 139 of Exhibit Number 20, which is Mr. Hansen's modeling, there's a source thickness or -- it's referenced up here, it's the fourth line down, very hard to see on the exhibit. I'll try to zoom into that. Right here it says, Source zone thicks -- nick -- .1, and that's meters. And it has a derived function, but in this particular output parameter it's listed as 4 inches, is the mixing zone.

Q. And what page are you on, Mr. Hansen [*sic*]?

A. I'm on page 139 of Exhibit Number 20 of Mr. Hansen's modeling. And this is consistent across all of the exhibit models that --

Q. If Mr. Hansen were to testify that that was simply the default scenario and that that was not the actual mixing zone computed in that example, would you be able to disagree with that?

A. No. I would wonder why information was presented to the Oil Conservation Division that included this default parameter, as opposed to a real situation.

Q. And you said you did not run the model yourself?

A. That's correct.

Q. Have not done so?

A. That's correct.

Q. So you're not in a position to tell us that Mr. Hansen's running of the model results in incorrect figures for the inputs that he -- for the input parameters that he used?

A. No, I didn't say that.

Q. Okay, thank you.

Now you also familiarized yourself with the HELP model?

A. That's correct.

Q. And what does the HELP model do, in general terms?

A. Well, the HELP model is a landfill model. It's basically utilized for the vegetative cover portion. It is the top portion of the modeling, relevant to our discussion today. It encompasses vegetative effect, a layering effect, and there are a number of input parameters that were not placed in the model, in the HELP model of the OCD, that would have been more realistic, specifically in northwest New Mexico.

Q. And are you talking basically about the climatological factors?

A. Well, there's the climatological factors, and there's also the depth of cover, which I believe is a significant item with regard to this in the modeling.

And then in addition to that there's also the

liner quality, and then a lack of input of what I would call a bentonite clay layer, which would add additional protection in the HELP model portion, or the upper portion of the model.

Q. Did you study Dr. Stephens' work?

A. I have not studied his work thoroughly.

Q. Are you aware that Dr. Stephens used a soil type as loamy sand?

A. If that -- I know he used several -- he had several input parameters into his model. I'm not sure if you're referencing his VADSAT model or if you're referencing -- because that was the portion of the model he utilized. He did not utilize basically an equivalent to the HELP model in the top portion.

Q. He did not use the HELP model but my understanding was, he used the MULTIMED model to predict the movement of the waste down to the vadose zone, and he used -- no -- or -- no, he didn't use -- MULTIMED model is the one Mr. Hansen used. I'm sorry, I'm mistaken.

VADSAT model, he used the VADSAT model to predict movement in the vadose zone, and then he used a separate model to predict movement in the aquifer. Is that your understanding?

A. I believe Mr. Stephens' testimony will stand on its own.

Q. Well, I'm trying to understand -- I'm trying to ask you -- I'm going to ask you a question about it, but are you sufficiently familiar with his testimony to say I'm wrong or -- I'm right or I'm wrong?

A. I'm not familiar with the VADSAT model, so I don't know if I'm qualified to talk about that particular model.

Q. So are you --

CHAIRMAN FESMIRE: Mr. Mullins, I don't think that was the question. Would you go ahead and re-ask the question, Mr. --

Q. (By Mr. Brooks) My question -- my question that I had just asked you, Mr. Mullins, was, are you aware that Dr. Stephens used the VADSAT model to predict the movement of the waste down to the water table, and then that he used a separate flow model to predict movement of waste within the aquifer?

A. I thought he had used the VADSAT model to do -- that covered both of those. The VADSAT model is equivalent or similar to the MULTIMED model. You specify the distance to the monitoring well within the VADSAT model in the same manner that you do the MULTIMED model.

Q. Are you familiar -- are you familiar enough with his work to tell me whether or not one of the input parameters that he used was the soil type for the waste?

A. You'd have to reference an exhibit to show me what that is. I don't have that off the top of my head.

Q. Okay, so you can't answer the question what input parameter he used?

A. Not without looking at the modeling sheet, no.

Q. Well, I don't believe -- I don't -- he -- unlike Mr. Hansen's, Mr. -- Dr. Stephens's input sheets were not introduced into evidence, so --

A. Yeah, so I haven't seen them, that's correct.

Q. Okay. Do you agree with Dr. Stephens's -- okay. What he -- what he used -- his input parameter that I'm asking you about is actually in his presentation, so if we can go to page 8 of Exhibit Number -- of industry committee's Exhibit Number 3, we can get to the question I was going to ask you.

A. I'd need to have someone supply that to me. Page 8 of Exhibit Number 3?

Q. Okay, I have a hard copy, but I have some notes on it, so if anyone else can supply a copy, I would -- I was hoping we could get it up on the screen, but I'm not sure we can.

MS. FOSTER: Is it on the screen here on the right? There's a folder called Statements.

MR. PRICE: No, we don't have it there. It's not there.

Q. (By Mr. Brooks) Okay. Well, I think my notes are fairly innocuous, so I will show you this page. What I will call your attention to is the first sentence in the bottom paragraph there.

I'm sorry, I forgot to request to approach the witness. My apologies --

CHAIRMAN FESMIRE: I'm sorry, I forgot to notice.

(Laughter)

THE WITNESS: I haven't read this report. This appears to be a report from Daniel B. Stephens and Associates, Inc., on -- it's titled Three Modeling Scenarios. It's page 5 of some report.

Q. (By Mr. Brooks) Well, that was the right answer, Mr. Mullins, because I was going to ask you a whole bunch of questions about that report, and if you haven't read it I'm probably not going to ask it much, so -- But I will ask you about that one.

Based on the sentence I called to your attention, would it be accurate to say that Dr. Stephens assumed a loamy sand for the waste -- for the soil constituency of the waste?

A. I see a sentence on this piece of paper on page 5 that says USDA classification would be loamy sand.

MR. BROOKS: Very good. May I retrieve the --

CHAIRMAN FESMIRE: You may, sir.

MR. BROOKS: -- Exhibit? Thank you, Mr. Chairman.

THE WITNESS: I don't know in what regard that particular sentence is without having looked at the entire report, but that's what that says on that page.

CHAIRMAN FESMIRE: Mr. Brooks, would you cite the exhibit and page number for the record?

MR. BROOKS: The exhibit -- this is industry committee Exhibit Number 5 -- no, Number 3, I'm sorry, and it's on page 5. And the context -- in context it says, it reads, Based on industry estimates, the soil in the pit contains about 12 percent clay and 80 percent, and the remaining 8 percent is silt, which by USDA classification would be loamy sand. The pit and native soils are assumed to have the same hydraulic properties.

Q. (By Mr. Brooks) Now are you aware that Mr. Hansen used a soil classification that would have a tighter soil than that, that is, more clay in it than what Dr. Stephens assumed?

A. I guess the relevance of the discussion of soil type would in turn get down to the hydraulic conductivity of the actual soil type, so I would need to look at the exact permeability or hydraulic conductivity of which respective soils that we're comparing, in order to answer your question.

(Off the record)

CHAIRMAN FESMIRE: Mr. Brooks would you like to take a break to get ready for the cross-examination?

MR. BROOKS: Well, I think I've already asked the question, and I will -- I don't believe Mr. Mullins actually answered it, so let me re-ask the question.

Q. (By Mr. Brooks) Mr. Mullins, are you aware that the Division, or Mr. Hansen, used a soil classification that was a tighter soil classification than that used in Dr. Stephens's model?

A. If you tell me that, then without looking at the information I'd have to agree with you. But I don't have those figures in front of me.

Q. Thank you, that's all I'll ask on the subject.

Do you agree or disagree with the industry committee's recommendation of a 3500-milligrams-per-kilogram chloride standard in the waste for pit closure?

A. I disagree.

Q. And on what basis?

A. Well, 5000 is higher than 3500.

Q. I won't argue with that. Well, I stand corrected, since this is an SPLP test, it's milligrams per liter, not milligrams per kilogram, so I misspoke.

But you say you disagree with it, you disagree with the industry committee's recommendation?

A. Well, I support the higher figure.

Q. Okay. Now, Mr. Mullins, that gets back to something else in your testimony that really kind of confused me, because you looked at the Division's pit contents report, did you not?

A. Yes, I reviewed all of the soil and fluid testing that was done by the OCD.

Q. And then you said that to interpret the results for a particular level of chlorides in the waste under the modeling used by Mr. Hansen, that he should have -- Well, let me back up and start over again.

You said, as I understood it, that the actual results of concentration in the waste observed in the pit sampling should be diluted 20 to 1 when you apply them to Mr. Hansen's modeling, if I understood you correctly. Is that what you said?

A. With regard specifically to the soil samples, which were taken in milligrams per kilogram in relation to the chlorides for northwest New Mexico utilizing the SPLP method would reduce that concentration or the leachate by a factor of 20, placing that figure into milligrams per liter.

So referencing in particular the slide 133 of Exhibit Number 20, which has the chart at the top, and it's listed, San Juan Basin pit release, 1000 milligrams per

liter initial concentration, none of the solid data that was presented in any of the testing analysis would indicate that a figure of 1000 would be possible utilizing the SPLP method. The highest figure that would be possible from any of the analysis would be 265 milligrams per liter.

So this particular model or chart is overstating the impact by a factor of four.

Q. Well, are you aware that Mr. Hansen did not use the SPLP method to derive those figures that -- the figures that he assumed for the initial concentration?

A. My understanding was that his modeling was supposed to be realistic of the currents in northwest New Mexico, and 1000 milligrams per liter initial concentration for leachate coming into the MULTIMED model would not be reasonable or accurate by a factor of four, even utilizing the highest concentration.

Q. But it's just an assumed figure, correct?

A. Well, I don't think we're dealing with assumptions here in this important matter dealing with pits. I think we're trying to deal with reality and protection of the public in the groundwater.

Q. Well, the HELP model derives a leachate concentration, correct?, from the various input parameters, whatever they are, that you used to put in here -- that you used to run the HELP model?

A. Actually, you determine what that figure is. So for instance, this 1000 milligrams per liter initial waste concentration is an input parameter into the MULTIMED model.

Q. Well, it's an input parameter into the MULTIMED model, but isn't it an output parameter -- isn't the actual concentration an output parameter from the HELP model?

A. I don't believe it is. We have Mr. Hansen's output modeling from the HELP model with the first portion of Exhibit 20. We could go through and look at that.

Q. But what Mr. Hansen has done here is take an assumed level and run the MULTIMED model based on several different assumed levels to come to -- to illustrate what the results would be, correct?

A. He's utilized in his lowest-case scenario an assumption that is four times the highest level of concentration that is even listed as a solid reference in northwest New Mexico. And that's his lowest-case scenario, and it's referenced here on page 133 of Exhibit 20. And that doesn't seem reasonable or realistic. It doesn't utilize any average concentrations in any manner, and it overstates the impacts dramatically.

(Off the record)

MR. BROOKS: I think that's all my questions. I'll pass the witness.

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

When we come back, Ms. Foster, you can do the -- begin the recross.

Oh, no, I'm sorry --

(Laughter)

CHAIRMAN FESMIRE: I imagine -- it looks like Commissioner Bailey might have something to say about that. We'll come back and --

MR. JANTZ: Mr. Chairman, members of the Commission, I just want to remind you that Mr. Neeper is here and would like the opportunity to cross.

CHAIRMAN FESMIRE: I would assume, Dr. Neeper, since you weren't here for the direct examination, your cross-examination would be rather limited, wouldn't it?

DR. NEEPER: It would be limited strictly to testimony given this morning.

CHAIRMAN FESMIRE: Okay, when we come back we'll give Dr. Neeper the opportunity to cross-examine. Thank you.

And we'll reconvene at 10:30.

(Thereupon, a recess was taken at 10:20 a.m.)

(The following proceedings had at 10:34 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 all present, a quorum is therefore present.

We were in the latter stages, I hope, of the cross-examination of Mr. Tom Mullins.

I believe, Dr. Neeper, you indicated that you had some questions of the witness?

DR. NEEPER: Yes, sir.

CROSS-EXAMINATION

BY DR. NEEPER:

Q. As others have said, good morning, Mr. Mullins.

A. Good morning, Dr. Neeper.

Q. My questions deal strictly with technical issues that you have brought up this morning. The first one deals with a clarification of this 20-to-1 dilution, because that has wandered through this hearing in many ways.

You had mentioned, I believe, that a concentration used by the Oil Conservation Division was inappropriate or excessive relative to the 20-to-1 dilution; is that correct?

A. Yes, I referenced that the 1000 milligrams per liter, which was the lowest model run on the MULTIMED, appears to be four times higher than the highest reading on the chlorides in the solids would indicate from the testing.

Q. Would you explain to the Commission where that -- what that 20 to 1 of the test means, what its origin is?

A. For the Commission's benefit -- I know this has been discussed previously -- the SPLP method for leachate assumes a 20-to-1 dilution solubility of the chlorides into the liquid phase.

So if you had a 20,000-milligrams-per-kilogram sample, it would turn into a 1000-milligrams-per liter sample that the OCD utilized in its lowest case.

Q. I'm going to restate that and ask you if I have stated it correctly.

The test prescribes, if I am correct, that one should use 20 liters of distilled water to leach whatever contaminant there may be out of one liter volume of soil; it's 20-to-1 volume ratio. Is that not correct?

A. I believe -- That's correct, on a -- on a volume basis.

Q. And in terms of the relationship to what one might find being leached out of a pit, would it ever be reasonable to assume that a pit was leached with 20 times its volume in water?

A. I don't believe so.

Q. So in fact, then, it would be reasonable to assume that you would have much higher concentrations leaching from a pit than you would find in a leach test; is

that not correct?

A. I don't believe so, no.

Q. No?

A. No. And the reason -- one of the reasons in particular -- it was also listed in Mr. Hansen's model -- is, there was no decay factor placed upon the waste source. And over time, the waste source concentration would be reduced.

And so I don't believe that would be correct, no.

Q. Can you explain, if the waste is chloride, how that would be reduced over time?

A. The solubility tests, which were not performed by the OCD in this matter -- if you leach off some chlorides that are mobile it is highly likely, given the sampling that I've reviewed, that a large portion of the salts are immobile and may be associated with the cement material that was also in the reserve pits.

So I don't -- So for instance, if you took the highest readings that were measured of 5290, if you're trying to indicate that there would be 5290 in the leachate, I don't believe that would be reasonable or possible.

Q. I want to be sure I understand you correctly. You're saying that what was measured in the pits from the solids may not be representative of what could be leached

out; is that right? That it would be immobile, that the chlorides would be immobile within the pit solids?

A. Based upon the testing that was performed by the OCD, it is highly likely that a large portion of the salts are immobile and not in contact with the fluids from the waste sample. There's a difference between the effective porosity and the total porosity in the waste sample, and there could be a very large percentage of the sample that would not be in contact with flow, because it would be in contact with the effective -- effective porosity of the waste.

Q. Would you just explain what is the effective porosity, versus the other porosity?

A. For the Commissioners' benefit, there are -- total porosity would be the total pore space in a sample. The effective porosity would be the effective conduit of that porosity interval, which is typically lower than the total porosity sample. In the modeling that was performed, it was assumed to be the same.

Q. And you're suggesting that chloride would not be transmitted by diffusion or other means from the less effective porosity to the -- what you call the effective porosity?

A. If it was effectively encapsulated in the cement portion of the residue that is in the reserve pits, I don't

believe that portion would be mobile.

Q. Are you familiar with the tests done on cemented pit wastes, cemented -- they were manufactured pit wastes, but hypothetical pit wastes?

A. I was here present for your testimony and saw the benefits, some portion of benefit that was made with regard to the waste contamination if there was cement, and I believe that a portion of that could be related to the difference between effective porosity and total porosity of the sampling. So that would further reduce the leachate concentration of chloride.

Q. All right, I will ask just more question related to that.

So you feel that if chloride is present in the pit material, not all could be leached out?

A. Correct, it would be stabilized and immobile.

Q. And so then it would not appear in a leach test either?

A. Correct, it would be stable in the soil material.

Q. Very good, thank you.

You brought up the total dissolved solids in the San Juan River. I believe you presented some data on that and spoke of it this morning that whereas you found an average, if I am correct, of something like 440 TDS in the river, you questioned, then the sensibility of a 250-

milligram-per-liter chloride standard in water; is that correct?

A. I stated that the information I presented dealt specifically with salinity, as opposed to solids, total dissolved solids, which is different from -- they use the same symbols, TDS, repeatedly, so you have to be careful about what you're actually referencing.

So my statement was that it was strictly for the beneficial purpose of the Oil Conservation Commission to be aware that the current salinity levels in the waters that are supplying the drinking water for the majority of the people in northwest New Mexico is currently -- the average concentration of salinity is 441 milligrams per liter. The specific constituents of the salts are available with the Bureau of Reclamation information to -- you know, with specifics as to which part is calcium, which is magnesium, which is sodium. That data is available on the reference material that I listed.

Q. Do you know how -- what fraction of that, or how much is chloride, so that it could be compared with the 250-milligram-per-liter chloride standard?

A. That is the direct comparison, they measured chlorides. And they also did -- I believe it was around 1960 or so in the data sets, where they actually started plotting the specific concentrations of chemicals -- or of

the constituents, being calcium, magnesium and sodium, potassium.

But prior to that, it was just strictly the chlorides that were being measured, and that's the consistent figure average of 441, is a chloride direct reading, which would compare to the 250 standard.

Q. So you're saying the 440 TDS is really a 440 chloride?

A. That's correct.

Q. Thank you. You -- In your Exhibit 10, you were dealing with the mobility of the nonaqueous petroleum liquids, sometimes known as NAPL.

A. Yes.

Q. And from that did we understand you to say again this morning, that given the concentration of NAPL to be expected, it would be in the immobile range?

A. That's correct.

Q. If NAPL were present in a pit for most of the petroleum liquids that might be present in a pit, would one not expect to see some evidence of it floating on the surface?

A. Yes, normally the hydrocarbons are of a lower density than water. Not always is that the case. In certain characteristics you can have some heavier hydrocarbons that would be more dense than water.

Q. And isn't it required that any floating hydrocarbons be removed from the pit?

A. Yes, under both the current rule and the proposed rule, all free liquids are to be removed from the pit, including visible oil. And I know there's been discussion about which is visible and which is measurable, but we remove the oil from the pits.

Q. So why would there be a nonaqueous petroleum liquid among the pit solids if it's been removed from the floating layer?

A. Again, it's very minor, it's below the saturation levels that are listed in the reference document, so obviously the oil came in contact at some point with some portion of the solid. And it is attached to that soil particle. So that's why it has a residual concentration that's identified in the sampling.

Q. But the -- any vapor component or volatile component and any dissolved component could still be mobile; is that correct?

A. Well, not based upon the information that's been presented by the Oil Conservation Division. The data indicates, I believe in almost every instance, when taking a direct waste sample referencing the mobility chart and the reference item on nonaqueous-phase liquids, if they are measured from a total petroleum hydrocarbon basis, they

would be below the mobility range referenced in the particular exhibit that I have.

Q. I want to clarify that. It's the nonaqueous phase that would be immobile, but would that leave either a volatile phase or a dissolved phase as immobile?

A. Well, that wouldn't reference this particular paper and its constituents. There's been a lot of discussion about benzene, for instance. That is a volatile organic.

And as I had previously spoken, the current technique in northwest New Mexico is not to enclose the top part of that liner from a vegetative cover standpoint, because there are some minor volatile organics, and those can actually push the liner material up into the vegetative cover zone and inhibit vegetation. So the volatile organics, it's actually better for them to volatize and go to the atmosphere.

Q. But the point is still made that a dissolved phase would still be mobile, or a volatile phase would still be mobile.

A. It --

Q. I'm just clarifying. You're saying only that nonaqueous phase is immobile?

A. Correct, based upon the information presented.

Q. And the final question deals with that paper you

showed by Brian Andraski in which he showed installation of a lysimeter in the desert, and you mentioned, I believe, that he found the penetration of water from the surface -- or chlorides from the surface, went only as deep as 30 feet; is that correct?

A. Yes, over a time period of between -- he references between 16,000 years and 33,000 years, but I referenced the 16,000-year time frame.

Q. And that would depend on the amount of rainfall and the balance of rainfall against plants; is that not correct?

A. Yes, that would be a function of that.

Q. So it would depend very much on the local climate?

A. It would be dependent upon a number of factors, yes.

Q. Would it depend, in the case of pits, on one additional factor and that is the moisture that is buried with the pit? Would not that moisture also contribute to possible flow, as perhaps you might have seen some reference to in my testimony?

A. Yes, I believe the soil moisture is a significant item in the modeling parameters, and there were a number of assumptions made on soil moisture by yourself and Mr. Hansen in the modeling, that I recall.

Q. Yes. The difference I'm trying to bring out is, the paper you cited dealt with only natural moisture. Would there be a different situation due to the fact that, whatever one is burying in the pit, it contains an unnatural amount of moisture at the time it's buried?

A. If it had a higher moisture content. But again, if it was exposed to the appropriate climatological situation, the data indicates the majority of that moisture is moving in an upward direction and not in a downward direction to impact groundwater.

Q. So if it moved in an upward direction, then, it would also carry any mobile contaminants with it in that direction?

A. I believe it's possible to carry some of those constituents, yes.

DR. NEEPER: Thank you, no further questions.

CHAIRMAN FESMIRE: Commissioner Bailey?

EXAMINATION

BY COMMISSIONER BAILEY:

Q. Let's go back to completion techniques for Fruitland Coal wells. You operate several Fruitland Coal wells, 600 to 900 feet total depth?

A. Yes, that's correct.

Q. Is cavitation the most practical and effective completion method of choice for Fruitland Coal wells?

A. In the deeper portion of the Basin where the coal gas contents are much higher, those typical depth range of those wells are approximately 3500 feet in depth, and the specific case that I referenced was a very shallow -- that would be a cased and fracture-stimulated completion in the Fruitland Coal, as opposed to the cavitation method.

But that cavitation method encompasses the predominant amount of production in the Basin. Over 50 percent of the Fruitland Coal production is from a cavitation method.

Q. Are you saying thousands of wells?

A. I believe there are about 6000 Fruitland Coal wells in the San Juan Basin, and it would encompass approximately 3000 wells, yes.

Q. How often do wells have to be recavitated as part of the maintenance of that well?

A. That's a frequent occurrence. The coal fines that are produced along with the gas or fluid tend to approach the wellbore liner material area and compact and plug off the flow. So those coal fines are basically inhibiting the flow of production.

So it's a fairly occurrence to have a workover operation -- I referenced it as a recavitation -- to move on that existing well, remove the liner and recavitate the cavity or hole area, and then reinstall a new liner in that

type of completion.

It's a fairly common occurrence. I would say it happens probably at least two times in the life of that well, from my experience.

CHAIRMAN FESMIRE: Can I make something clear? We're using the phrase "liner" here in a couple of different contexts. Would you explain that?

THE WITNESS: Yes, the liner that I'm referencing is -- in this particular instance, is a 5-1/2-inch-casing-diameter liner, and liner in that instance is the actual steel material going down inside of typically a 7-inch casing string in northwest New Mexico and placed in the well with a liner hanger material item.

So that -- yes, thank you, Mr. Chairman, that's different from the liner that we're talking about in the pits.

Q. (By Commissioner Bailey) So at least twice in the life of a well which may last 30 years --

A. That's correct.

Q. -- you're going to have to recavitate?

A. Yes.

Q. Have you testified that the closed-loop system makes cavitation impossible?

A. I'm not aware of how to fully enclose under some of the representations of closed-loop systems a cavitation

process. You will need a pit, you will need an earthen pit area to handle -- to handle that operation. I do not know how to handle that significant volume of solids under those conditions, under the proposed rule.

Q. So would you say a requirement for a closed-loop system would have a strong impact on the production of Fruitland Coal gas in the northwest?

A. Yes, it would.

Q. Among the reasons given for the taco instead of the burrito was restriction on volatilization, and you made a comment that vegetation grows better where there's a taco and not a burrito?

A. Yes.

Q. Have you ever used microseepage and its effect on plant life as a method for spotting wells?

A. I have not, no.

Q. Okay. Have you read or heard about the use of microseepage and what negative impacts it can have on vegetation?

A. I have not.

Q. What are the -- You talked about the raising of a cover from gases that are produced within the pit contents on burial.

A. Yes.

Q. Could you tell us what the technical analysis is

for that gas? Is that H_2S, is that methane? What kind of gas are you talking about that's been trapped beneath those covers?

A. Typically, it's -- my understanding is that that gas is a hydrocarbon-based volatile that is coming off of the material in the pit.

There was some reference to the testing on benzene, ethylbenzene, toluene. Several of those samples are volatile.

In addition, there could be additional organic material that is decomposing, that was naturally occurring in the drill cuttings, and that could evolve through just natural degradation into volatiles.

And some of that could be H_2S or hydrogen. It's probably more hydrogen than it is hydrogen sulfide, that would be in the volatile form.

Q. So with the burrito style, we have the potential for generation of methane?

A. Well, it has the potential to try to encapsulate and enclose that volatile organic, rather than releasing that volatile organic in an evapotranspiration occurrence and allowing it to degrade to the atmosphere.

Q. Let's look at your Exhibit 8.

A. I actually don't have numbers on my copies, so if you can --

Q. It is the graph of the San Juan River near Bluff, Utah --

A. Yes.

Q. -- where you testified that the average TDS, salinity, chloride concentration was over 400 in the question -- its relationship to groundwater standards or water standards that we have in New Mexico.

With the movement of the river from New Mexico into Utah, do you think maybe the river may be draining formations that are not part of the San Juan Basin as a geologic feature and may actually be -- have its chloride content raised by going through, say, the Todilto formation or others that are found between the state line and Bluff, Utah?

A. It's definitely impacted by all of the input parameters, and that's why I attempted to also reference Archuleta, New Mexico. The Bureau of Reclamation -- this is the closest data that I could find that I thought would be relevant to the Commission.

But the answer is yes to your question, Commissioner Bailey, that it would be affected by all of the surface runoff and water flow into the river at that point in the San Juan -- the San Juan River near Bluff, Utah.

Q. So it's not really a fair question that's you've

asked, is it?

A. Well, I've tried to find the closest piece of information, and it is downstream of the San Juan Basin. It's the only data that I have available, and I don't have the actual -- I personally did not go test the river water, given the time of the hearing, but I believe that would probably be relevant. And I believe this is similar in salinity.

In my write-up I reference the Colorado River in -- at Hoover Dam, and the salinity level at Hoover Dam is 763 milligrams per liter.

So the entire Colorado River system has had a large amount of work done to try to minimize the salt content that goes into the surface waters of the entire Colorado River.

Q. Let's look at your Exhibit 9 which is the article, Waste Burial in Arid Environments. Page 3, the right-hand column. It's a pretty detailed list of exhibits that we have, so I would particularly like to have a couple of sentences from this article read into the record, please.

A. Okay.

Q. Okay, on the right-hand column, the paragraph that begins, Backfilling...

A. Yes.

Q. Okay. If you go down several lines, would you please read the couple of sentences that begin, These initial dry conditions?

A. Yes, reading from the third page, These initial dry conditions can change substantially, however, in response to subsequent precipitation and a lack of vegetation. On an annual basis, no water accumulates in the vegetated soil because water is removed by the plants. In contrast, even under conditions of extreme aridity, water accumulates in the nonvegetated soil and test trenches.

Would you like for me to continue?

Q. One more sentence.

A. Water that has accumulated at the three disturbed sites is continuing to percolate downward.

Q. All right, that's the relevant paragraph, which indicates that under arid conditions vegetation plays -- is the crux of transport?

A. I believe that's been all of the testimony that's been presented to the Commission, is that vegetation cover and having adequate vegetative cover is critical to minimizing and reducing contaminant flow downward.

COMMISSIONER BAILEY: Thank you, that's all I have.

CHAIRMAN FESMIRE: Commissioner Olson?

COMMISSIONER OLSON: Yeah, I have several questions.

EXAMINATION

BY COMMISSIONER OLSON:

Q. I guess coming to this -- just starting with this issue of modeling, you had a lot of focus of that in your testimony. Do you consider yourself an expert in vadose zone and groundwater modeling?

A. Given our small company and my limited amount of time for this particular hearing and the matter at hand, I believe my comments are relevant. But I don't believe that I have run the model a sufficient -- you know, in any capacity to be titled an expert in that modeling.

Q. Or in any groundwater modeling or --

A. Well, in fluid flow, in the input parameters for fluid flow, I believe I would be an expert in the input parameters, because they're similar in all fluid flow through porous media.

But in the particular case at present, I had to identify what model was presented by the Division. There was no modeling discussion during task force meetings or -- from my understanding, or input parameters that would allow my expertise to be developed further.

Q. Because one of the reasons I ask that is, you seem to be confused on the modeling that was presented by

Dr. Stephens and what it actually represents.

A. I'd have to reference Dr. Stephens's exhibits.

Q. So you're not familiar with the VADSAT model or --

A. No.

Q. -- any other models? You're only familiar with the one instance of looking at this model and no modeling experience prior to this?

A. No, I'm only familiar with the modeling as it relates to this particular case.

Q. And so your testimony is really -- seems to me you question some of the assumptions that go into the model, and so you're really giving more of a lay opinion of whether you think those are appropriate for use?

A. I don't think it would be a lay opinion, but, Commissioner Olson, I know you have a great deal of experience in the modeling. And as you're aware, the input parameters, and using realistic input parameters, I think, are critical to getting a meaningful output.

And I guess my testimony that I'm trying to make aware to the Commission and for the record is that there are -- there's some differences in the input parameters that may be appropriate to be considered, to have a real-world modeling example.

Q. But then you seem to put faith within the

modeling that was done by Dr. Stephens, and that is based upon assumptions as well; isn't that correct?

A. I was present for Dr. Stephens' testimony. That was late on a Friday afternoon, as I recall. He had assumed no liner material, did not believe that was relevant. I believe Chairman Fesmire indicated that that was relevant, and I concurred with -- concur with his opinion, and I think having an adequate liner would be a benefit to the public and would help minimize contaminant flow.

So -- But I am familiar with Dr. Stephens's testimony. He did not have his information on his modeling available for either the OCD or for my review, so I don't think I could comment substantively regarding his particular modeling parameters.

Q. But you kept mentioning using real-world data.

A. Yes.

Q. And were you here for some of the testimony of Dr. Stephens?

A. I was present, yes, for all of Dr. Stephens's testimony.

Q. And we've got a -- and you did some discussion of this concept of assumptions that the Division used in their mixing zone.

A. Yes.

Q. However, Dr. Stephens in his testimony had stated that he used a 50-foot mixing zone where he was modeling the 2.5 millimeters per year, are instantaneously mixing across the entire 50-foot thickness of the aquifer.

A. I believe he had indicated that that's what occurred in his model. He had a full 50 feet of mixing zone interval. He did have approximately the same ground -- the monitoring well location as the OCD did, in relation to that being right at the edge of the contaminant source.

Q. And a 50-foot aquifer that is considering an area of -- I thought he was saying 150 by 150, I'm not sure what the -- we're looking at -- a 50-foot-thick aquifer at 150 foot by 150 foot is a substantial volume for dilution of your model, your modeling results; isn't that correct?

A. It could be, but I believe Dr. Neeper adequately did a lay experiment demonstrating the difference in salinity and how it disperses into another fluid, basically mixing two different salinities, reach an equilibrium over some time period.

And with regard to the full 50 feet, I do not know if 50 feet, at least at the edge of the contaminant source, would be appropriate for a mixing zone. That may be appropriate 10 meters downstream from a source that would also be dependent upon a number of input variables regarding the aquifer recharge rate in particular, so -- so

he utilized 50 feet, is my understanding.

Q. And while you were just referencing Dr. Neeper's demonstration of colored dye and water as a dispersion of a contaminant, I believe you said it took, you know two days -- I don't remember exactly what it was from Dr. Neeper's testimony, but it took some period of time for a relatively small volume, isn't that correct, of fluid?

A. As I recall his example, it was a two-day period of time. I'm not sure of the actual volume.

But in the modeling that we're talking about, we're moving smaller volumes over a longer period of time, and we -- I haven't -- I don't know the difference in density between the contaminant source and the actual aquifer. There's assumptions based upon what the salinity is of the aquifer itself. If you have a denser fluid on top of a less dense fluid, it would tend to mix and go down via gravity.

So I believe there's some level of mixing. But given the parameters, I don't believe that .1 meters that the OCD utilized, which I had just learned as, I guess, the standard input -- my understanding is that it's a calculated value, it's listed to be derived, and that was not done in the OCD modeling.

Q. Well, I guess from Dr. Neeper's modeling, what looked to me to be a glass of water, it took two days for

the contaminant to disperse evenly through a small volume of water; isn't that correct?

A. Dr. Neeper actually placed solu- -- the more brine-dense fluid at the bottom of his glass sample, as opposed to placing it at the top of his sample, for instance. It would probably realistic to assume that the coloring would change much more rapidly. I think he did that because it was a good visual representation of the mixing that would occur when you have a more dense fluid at the bottom and you're actually mixing it with a less dense fluid on top.

Q. But that was under static conditions of just pure diffusion; isn't that correct?

A. I believe that's correct. I don't know if there was a temperature effect, you know, on that mixing, on how he had that particular item placed, but temperature would have an effect, you know, on that dispersion also.

Q. But the aquifer is not a static condition; isn't that correct?

A. That's correct. So I think the mixing would occur to a greater extent in a real-world example, as opposed to having a static condition.

Q. So then do you disagree with the figure that the Division presented on what a typical mixing zone looks like under aquifer flow conditions?

A. I -- under the conditions that were presented, yes, because I don't believe they're realistic, to confine the mixing in this manner to an aquifer that hasn't moved. You know, we've basically been discussing presence of contaminants and then having them migrate vertically down to the aquifer.

And then they're -- in all the modeling that's been discussed, there actually hasn't been a discussion of migration of the contaminant in a lateral sense along the aquifer to a well, a groundwater well or something to that effect. That modeling is based upon the well being right at the edge of the contaminant source, which is a very conservative method of modeling that.

So I believe the mixing zone depth should be increased.

Q. And have you ever studied mixing zones or contaminant migration in the groundwater?

A. I've read some papers on that, yes.

Q. But you don't have any formal training or experience in it?

A. No.

Q. So according to your theory, then, that the -- a contaminant could come into the aquifer at 2.5 millimeters per year and instantaneously mix across the full thickness of the aquifer before it moves anywhere horizontally?

A. No, I definitely do not believe that I've stated that. I believe Dr. Stephens's model indicated that's what he assumed with regard to that, just as the OCD assumed it was confined to the top four inches.

I believe there's probably some reality of mixing zone under fully static conditions, which were represented by both models, that's somewhere different between 4 inches and 50 feet, and I would assume it would be greater than 4 inches and less than 50 feet.

Q. So then, I guess you would also conclude that Dr. Stephens' model doesn't represent real-world conditions either, because that doesn't actually occur?

A. I don't know specifically enough regarding dispersion in a static source on mixing time, because it has a number of variables that are input, so I could not tell you an exact depth that I could defend, defend here today, a depth of mixing zone that would be appropriate.

I just believe that 4 inches does not seem reasonable, based upon the information I've looked at for a mixing zone. And 50 foot, I don't know if that's reasonable or not. Dr. Stephens would have to defend that mixing zone depth himself. I didn't say that 50 was appropriate.

Q. Well, how can you defend one -- or criticize one mixing zone and not have an opinion on the other?

A. Well, I -- like I said, I believe it's not quite 50 feet, on a static basis, 50 feet, and I guess in my opinion would not -- but is it 49 1/2 feet? That I don't know.

I do believe that, based upon the modeling and the information that I've looked at, that confining it to the top four inches is not appropriate.

Q. And I guess following along with that, you have testified that if you increased that mixing zone thickness, you're going to decrease the concentration in the aquifer, because you have a lot more dilution of volume; isn't that correct?

A. Yes.

Q. So conversely, if I reduced the 50-foot mixing zone as unrealistic, then I would have a much lower concentration to be allowed in the vadose zone to be entering the aquifer and not cause exceedences of the standard; isn't that correct?

A. My understanding is yes, that if you reduce the mixing zone, that the concentration when it reaches equilibrium would be higher.

Q. Right. You testified that under the taco scenario that you cut the liner above the mud line and then mixed the pit contents with soils. How do you mix the pit contents with soils and not compromise the integrity of the

liner?

A. Well, I know there's been several witnesses that have indicated that this is a regular occurrence, that the liner is compromised during the closure process. That has not been my visual experience, seeing that.

You take soil material, the first usually -- the ones that I've been on personally, with a backhoe bucket, using the loader portion of the bucket, and placing that soil in on top of the existing pit contents and then backing up and picking up the remaining material underneath that and then rolling that, going back and getting an additional load of native soil and placing that in and working your way across the pit to close that.

That's been my experience, you know, in closing the pit. And I don't see, if you are not taking a backhoe bucket portion, for instance, that has the claws and placing it into the liner itself and tearing that. I could see how that would compromise the liner.

But the operations that I'm familiar with do not go down to that liner material. We leave some room between that.

And I believe that's probably similar to -- I don't have a direct experience on landfill stabilization, but I -- you know, it's probably similar in that you mix drier soil with soil that has contaminants that have some

liquids associated with it, to try to dry them and reduce the soil moisture, in fact.

Q. Well, then, if you're not fully -- it sounds like you're not fully mixing the pit contents, you're leaving a saturated layer at the bottom of the -- on the liner.

A. Well, I don't know if it's truly saturated. I think when you place additional weight on top of the material, with the liner you will see the liquids come out towards the surface.

And by closing a pit from -- you know, typically the pits that I've been on, we close them from the side that has the cement and most of the drill cuttings, and we work from that side first and then work our way into the side that has less drill cuttings, and typically the liquids move to that far side of the pit.

And so I don't necessarily believe that we'd be leaving a saturated layer down underneath that. I think we're probably squeezing that, pushing that to that far side of the pit.

Q. Well, it still sounds like you're not getting all that -- you're not getting the full mixture in the bottom, so you're going to have a much higher moisture content in the bottom of that, most likely.

A. You could assume that the bottom portion would have higher soil moisture, but also from that standpoint

the upper portion of the pit volume would have a drier soil moisture content. And so there's obviously some equilibrium level of soil moisture in the entire pit contents that you would use.

Q. And you know, I guess, you know, sticking along this line of using real-world data, has -- or have you ever looked at or have you known of industry going out and -- There's a big concern on real-world data. Why hasn't industry gone out and done some studies on old unlined pits in the San Juan Basin?

There's -- you know, prior to recently they used to use unlined pits for drilling up in the Basin. And if that matches the conditions that Dr. Stephens modeled, why hasn't industry done some studies?

There's lots of -- lots of old closed pits up there in the Basin. Why hasn't anybody studied what happens to the chloride content of the pits in shallow -- especially shallow water conditions?

A. I believe that some of the other industry witnesses may actually be presenting that data to the Commission, but I have not seen that data as part of the hearing yet.

Q. So have you done any sampling under -- It doesn't sound like if you're doing this taco approach you've actually done any sampling under the pit liners to see if

you've had losses of contaminants during its use, I guess even in the short-term use?

A. I haven't personally. And the data that's been presented were actually sampled right out of the pit --

Q. Right.

A. -- which I would naturally assume would be higher in concentration of contaminants than something underneath the liner material, so...

But I have not done any, but I believe the industry witnesses that have not testified may actually have some of that data that you're asking about.

Q. Okay. And so I guess when you testify that you haven't observed groundwater contamination from drilling pits, you haven't actually gone out, then, as I understand, then, to actually study to see whether there has been groundwater contamination from drilling pits; is that correct?

A. Well, I've researched all the available records that are available on the OCD website, all the material, I've been present at, you know, testimony here so far, and I have not seen presented to me a case regarding a temporary lined drilling or reserve pit in northwest New Mexico that has contamination below the liner material.

But I don't know how often that has been tested for in the northwest. I believe the data that's presented

is that the amount of waste that's in the pit, inside the liner material, is of such a low concentration of contaminants that testing beneath the liner, when it is done, whether it's enacted as part of the proposed rule or it's done as part of a science experiment in a cooperative manner with industry, would probably leave -- or generate the information that you're asking about.

And my personal belief is that that will be lower in concentration of contaminants than what was actually demonstrated in the pit-sampling program.

Q. Well, it's my understanding from most of the testimony that's occurred so far that nobody's really studied groundwater conditions around drilling pits, especially old closed drilling pits, to see what effects we've had from them; isn't that correct?

A. Well, I believe that -- I would have to agree with you. I mean, I've read the material. I'm not aware of a groundwater monitoring well program that had been placed around a drilling reserve pit to identify, you know, plume length or contaminant flow or anything to that effect. That would be probably something you could do in a cooperative manner to identify that plume-length occurrence.

I did look at the data that was presented in southeast New Mexico, and there were several instances of

monitoring wells that had been placed in reserve pits from the southeast.

In a couple of Mr. Price's exhibits there were several background data points that I was looking at where background wells were drilled on the same pad area, but that information wasn't presented by Mr. Price. And I kind of had the question myself, well, if we're saying contamination, what are those background readings, you know, representing?

So we probably need to obtain background information on the soil samples in the area, and maybe conduct that to determine the likelihood of a contaminant release and migration.

And based upon what I've reviewed in my experience, at least in northwest New Mexico, I don't see that occurrence being a threat to the public or the environment, especially with regard to the necessity of a new rule.

I believe that the current rule, adequately enforced, addresses the concerns of the public, and I guess that's my opinion.

Q. But then your opinion is not based on actual real-world data of groundwater conditions around drilling pits; isn't that correct?

A. It's based upon the information that's been

presented in this case and my review of it and my personal experience of -- in northwest New Mexico. I would have to, you know, defer to that. I have not identified a case of that, have not heard of a case, you know, that had that presented, at least in northwest New Mexico.

I've watched the 10 cases be presented in the southeast, and I don't know about those because I haven't had an opportunity to review those files.

Q. But then you seem to be saying just because -- you seem to be saying that the Division must prove the contamination first and we have to allow the harm first before we can prevent it.

A. I'm not saying that. I guess I'm trying to demonstrate the probability or the likelihood of impact to the public health and the environment, based upon the information of what we know. There were some questions regarding what's in the pits but, you know, those are legitimate questions that need to be answered. And I think some of that was identified from the OCD sampling.

But having the presence of a contaminant in a pit does not mean that it is directly harmful to the public. It needs to be based upon, I think, a risk-based approach. And factoring in risk, that it's appropriate to maintain the current rule and adequately enforce it, rather than add additional regulation in this matter of pits. In my

opinion.

Q. So then who -- if you have someone who's placing a contaminant out on the ground, whose burden of proof is it to show that it's not a threat to groundwater?

A. Well, I believe the way to approach -- you know, I guess to approach that scenario would be to, you know, talk with some operators and say, you know, we're concerned about pit contamination out here. We'd like to do some testing and soil sampling to get some background information, you know, to demonstrate that.

The data that's been presented to me does not indicate that underneath a liner -- because I'm not aware, at least in northwest New Mexico, of a single data point that's been presented regarding background data or contaminant below a liner, dealing with a reserve pit or a workover pit line.

You know, there is a tremendous amount of data, obviously, regarding production pits, and there have been some concerns about that.

But I don't believe that it's been demonstrated that there's -- you know, there's a risk when you get out and you walk across the street, and you might get run over by a car. But to say you're not going to go over and cross the street in that instance is not -- and if you need to get to the other side...

I think we need to have a reasonable protection level. You're not going to build a crosswalk in every instance, you're not going to build an elevated, you know, crossing area to cross every road. But there's certain roads -- such as wells, you know, in comparison to wells. If you drill a well down along the river where the -- you know, where the water table is high and there's occurrences, well then you would utilize the closed-loop technology and dig-and-haul scenario. And those are the instances that are in the existing rule, and I think those are appropriate.

But my reading of the rule and the siting criteria is that this is a tremendous burden placed upon the industry and the public with minimal to negligible benefit with regard from a risk profile, specifically in the northwest. I mean, that's where my experience has been.

Q. Well, I still seem to come to the idea that you seem to think that someone can dump wastes on the ground, and it's the State's burden to prove it's a problem and not the operator's problem to prove that it's not a problem.

A. Well, I don't believe that the information has been presented that wastes handled appropriately, which I -- you know, if wastes were handled appropriately under the current rule, under current Rule 50, and they're placed in

a lined reserve pit that's properly lined, and it is closed out in a proper manner and vegetated appropriately, under the current conditions, which have been my experience seeing that in northwest New Mexico, that that does not -- that's not taking waste and taking the dumptruck and dumping it into a wash, you know, something to that effect, you know, that's a whole 'nother level of risk and contamination.

We are under existing OCD rules and regulations regarding how we handle those wastes. And I think handled appropriately, the industry is doing a good job. In northwest New Mexico, that's been my experience. I think the data indicates that.

Q. Well, I think you're just saying there isn't -- nobody's really studied it, so what data is there to say that these pits haven't caused groundwater contamination, especially in shallow groundwater areas?

A. In shallow groundwater areas we would need to go and test below those pits. That might be an excellent, you know, science project to work with the Division, the BLM, the NMOCD.

I mean, I participate as part of the San Juan Basin Working Committee meeting that occurs every quarter up in the northwest, and we talk about issues that are of concern and we develop, you know, groups to work together

to go do some of these things, science projects, whether it's reseeding methods to find the best seeding mix for an area.

Because the BLM or someone may prescribe a soil cover that may be so prescriptive that you're trying to follow the prescription, and the people that are on the ground, you know, Well, that stuff doesn't grow here. And, you know, there's no vegetative cover.

But you need to -- So you get together and you talk about that, and we come up with a new soil mix, you know, that's appropriate.

So I think your question is, industry and the OCD should get together prior to enactment of a new rule indicating that the industry's contaminating everything. Maybe the OCD and the industry should get together and go do some of that sampling and find out how far that migration is.

And I think that would be worthwhile to do, but given northwest New Mexico, the contaminants that are within the reserve pits, within the samples, at least from what's evident, are below a threat to the public health, from what I can see.

Q. But that's theoretical, that hasn't been demonstrated with the studies, the real-world studies that you refer to.

A. I'm not aware of a real-world study that has been on a reserve pit, temporary, lined or unlined, in northwest New Mexico that identifies the contaminant plume, if it does occur. I'm not aware of that.

Q. And then I guess I'll come back. If you're -- if someone's going to discharge contaminants on the ground, isn't it their burden to prove that it's not going to cause a threat to groundwater?

A. I would agree with you, and I think that current rule allows the Division in instances, let's say, where there's a torn liner or there's a presence of movement of fluid -- There was an example shown on an XTO location which was near a watercourse, and there was some movement.

In my particular -- There were several steps prior to that occurrence even happening that were not best management practices. It appeared that that pit had been sited in fill material, as opposed to in the cut portion, you know, of the wellpad area. Don't know -- I'm not sure how that drawing and occurrence came to that effect, because that's present. But I believe it was remediated appropriately.

There could have been some additional requests from the Division to say, I'd like to monitor additional background sampling in this area, and that would have been a great -- you know, a great example to demonstrate.

But from what I heard from the testimony, it was determined that that was not a concern, that it did not go into the watercourse. And so I have to rely upon the Division in their expertise in that manner.

Q. Well, I guess are you aware of the history of pit regulations in the San Juan Basin? Do you operate in the San Juan Basin?

A. I do, and I've followed the history of the pit issue in its entirety. I may not be versed on every aspect of it, but I've read a great deal of the material. It was predominantly focused on production-related pits, from separators and dehydrators.

It should be noted that the dehydration pits were not even property of the oil and gas companies, of an operator such as myself. Those were pits, I agree, but they are pits from a pipeline company standpoint.

It is my understanding and my personal experience that almost all of those pits have been -- have had substitutions, and this has occurred primarily -- one of the reasons is that the operating pipeline pressures in northwest New Mexico, because of the Basin is depleting, continue to drop. And so the necessity of having dehydration equipment, even on the wellsites, because the operating pressures are so low, has caused the removal of the dehydration piece of equipment in its entirety. And so

that source risk has actually been removed from the majority of the well sites.

But the other pits have been addressed, I believe, under the appropriate rules and regulations that have been in place, and I think operators have spent large sums of money trying to comply with prescriptive requirements of the Division to do what's right. And I think operators want to do what's right.

Q. Well, I guess do you understand that in the past hearings in front of the Commission, the Division proposed eliminating all those production pits and were essentially told by industry, you haven't proved it's a problem, and therefore they got exemptions for those pits? And then the Division had to come back and conduct studies to show they're a problem before they can prevent that.

And I guess I'm curious as to why you think the burden should be on the -- you almost seem to be thinking that the burden should be on the Division to prove the problem, when the discharger is actually discharging contaminants onto -- water contaminants onto the ground surface.

A. I'm aware that there are several operators that still have earthen production pits in the northwest. It's my personal belief that that's not appropriate.

I think that under continuous hydraulic head,

which would be the occurrence of some of those production pits, that the likelihood of migration to groundwater is increased.

So I'm in support of having, you know, tankage to handle produced fluids. I think that's just -- I think that's a good best management practice.

But with regard to the reserve pits and workover pits, the proposed rule as it's been presented by the Division is very prescriptive in nature. But the benefit to the public health and the environment hasn't been demonstrated. The same question -- I mean, I want to just say yes when you ask me that question. The industry hasn't gone out and tested below that.

But I believe some of the industry committee testimony may actually address some of those -- some of those items that you bring up, because there's been a lot of focus on reserve pits and drilling pits here in the last month.

And the hearing has gone on a sufficient period of time that there may actually be additional information that would be beneficial for the Commission to consider.

Q. And then I want to go to your -- I guess -- was that -- Exhibit 8, and make sure I understand what you're saying. You're saying this exhibit shows a plot of total dissolved solids --

A. No, it's total -- it's actually total dissolved salts. When they say TDS in that particular instance -- Dr. Neeper asked me that same question, and that is specifically salts, it's not actually dissolved solids.

And it's referenced from a chloride test. The specific constituents -- in my letter I have referenced the web link where you can go to that particular website, and it lists I think about 40 or 50 specific site locations that the Bureau of Reclamation on the Colorado River system has tracked salinity in particular, not solids but salinity.

Q. Well, are you aware that in standard water quality sampling total dissolved -- TDS stands for total dissolved solids, which are salts, but it stands for total dissolved solids?

A. Yes, and that's why I wanted to make that distinction in particular, when it says TDS on the slide that it actually has the salt concentrations by a more detailed analysis when you go to the actual Excel file that my link references you to, and you can total --

Q. So this is total dissolved solids. Salts make up the solids that are --

A. Well, in reality there's actually additional solids, from what I can determine, that are flowing in the river. You know, for instance there's sediment load and

sediment analysis of movement and that. And in certain instances those would be solids that would be moving in the surface water. And I think there's some other data sets.

What I tried to bring to the Commission -- what I tried to bring to the Commission was the salinity, because I think that's the chlorides that we were looking for. But you know, the data has to -- is what -- is what it is.

Q. Well, I guess do you have much expertise in water quality sampling and water quality analysis?

A. Other than taking water samples regularly, produced water samples and having those analyzed with regard to oilfield-related activity and, you know, just general titration-type work to determine contaminants, no, beyond that I don't.

I know how to read the reports, I know how to read stiff diagrams, I know how to compare scaling tendencies, a number of things like that.

Q. So if I represented to you that TDS stands for total dissolved solids, you'd be okay with that?

A. I would agree with you, but in this particular slide that I have as evidence it is actual total dissolved salts, as they have it referenced. And I would have to refer you to my link. But I do understand that.

And I also -- on my other exhibit I tried to break out total dissolved solids, TDS, with capital T,

versus chlorides, and they are separate, they're a separate item. So I do understand.

Q. Well, I'm wondering if it's me that's confused or you that's confused, because TDS is -- stands for total dissolved solids, it doesn't stand for suspended solids or any other solids. It's a sample that you take and you submit it to the laboratory and you look at total -- they're not looking at suspended portions or anything else, other solids, they're looking at dissolved solids, which are the salts. They're sodium, calcium --

A. Right.

Q. -- you know, sulfate, chloride, you've got all these different -- it's comprised of essentially the salts --

A. Right.

Q. -- that make up the dissolved portion of the water.

A. Right, it is. But there's also a certain percentage of that, from my understanding, that you can even determine from some of the liquid sampling.

If you go over and look at the liquid sampling on my summary slide -- unfortunately, I don't know what exhibit number this is.

MS. FOSTER: That would be Exhibit 5.

THE WITNESS: On Exhibit 5, under the fluids, on

the right-hand portion, the bottom line is total dissolved solids that were determined from the trace analysis data. And the chloride concentration is a separate line item, along the -- I think it's the fourth or fifth line up there.

Total dissolved solids, in certain instances, they're even referenced on several of the trace analysis reports where there was a solid constituent in there that they tried to filter out, and some of it actually did not filter out. It was a smaller micron than what they had, and they had to dilute the sample in order to do the analysis.

So I believe I understand -- you know, the total amount of material that's soluble, I understand that. But there were some solids in some of the sampling that was done by the OCD, that were present in the liquid sample.

Q. (By Commissioner Olson) So you don't have a lot of experience in water quality sampling --

A. Other than telling you --

Q. -- water chemistry?

A. Other than telling you what I've said earlier, Commissioner Olson, no, I don't.

Q. And you're saying -- I thought you were saying before that this TDS represents chloride that you're -- on this --

A. I believe that the data that goes back to 1940 is strictly a chloride measurement. They did not distinguish that and do additional analysis to determine what salts in particular -- When you have a salt, there's obviously different chloride atoms, quantity, that would be in relation to that salt constituent.

So you could have -- you know, for calcium chloride, for instance, you could have two chloride atoms for -- you know, for every calcium atom.

Q. Well, I just have -- I'm confused because you're saying -- at one point you're saying this is total dissolved solids, and now you're saying this is chloride.

A. If I've misspoken, Commissioner Olson, I apologize for confusing you. This particular exhibit, the one that says San Juan River near Bluff, Utah, deals strictly with salinity. It does not deal with solids.

Q. And this -- the total dissolved solids of the water in the San Juan River near Bluff, it looks like the average of that water is somewhere around 450 or something like that?

A. Yeah, when I ran the spreadsheet it was 441, yes.

Q. And do you -- you said that's contaminated water? Is that what you're trying to imply with this?

A. No, I was basically trying to make the Commission aware of the current salinity level in the San Juan River

in relation to the matter at hand here.

Q. But if I look at your Exhibit 5, you're looking at total dissolved solids ranging from 6100 up to around 17,000. Are you trying to say this is comparable to San Juan River water?

A. No, I'm not making that statement. Those are the fluids. In relation to -- I guess for -- referencing my spreadsheet for the direct comparison, I guess that I would state -- is that I'm comparing -- is there a dissolved fraction? -- the dissolved chlorides level -- I believe I understand what you're saying, Commissioner Olson, is that the total dissolved solids, being these very large numbers, are the soluble portion of the salts in their entirety.

Q. And you know what the drinking water standard for total dissolved solids is?

A. I'd have to reference the WQCC, but I believe it's 250.

Q. Would it surprise you if I told you the total dissolved solids concentration for drinking water quality in New Mexico is 1000?

A. I remember seeing that figure, yes.

Q. So these waters here are fully within drinking water parameters that you're showing in Exhibit B, drinking water quality?

A. I believe those samples are actually drilling

muds. They're the liquid phase --

A. I'm sorry, I was talking about Exhibit 8. That's what --

A. Yeah.

Q. -- what you're showing here is --

A. Yes.

Q. -- within drinking water quality --

A. Yes, they are --

Q. -- for --

A. -- and I -- and -- yes.

Q. And are you aware that in -- typically in alluvial groundwater in the San Juan Basin, the chloride concentration of groundwater is less than 250 --

A. I could see that --

Q. -- milligrams per liter?

A. -- yes.

Q. And so if I look at Exhibit 5, we see there is a potential for contamination, but we have a lot higher concentrations of chlorides in these pits, then, just the potential, right?

A. I can't agree with -- you know, with that questioning, because that would assume that those fluids would be in contact with the San Juan River. If that occurrence did happen, there would be an increase, and there would be a contamination of the river. So yes, from

that standpoint.

But we have these in a pit that is lined, that has the normal protection --

Q. Well, that wasn't my question. My question was, there is high levels of chlorides, and there is a potential for groundwater to be contaminated because of the contaminant levels in these fluids and solids; isn't that correct?

A. I don't believe so. I believe that the solids from a leachate standpoint demonstrate, at least the testing, that it would not.

But I believe the liquids, if you place the liquids directly into the groundwater, into the river, that would be a contaminant of the river, yes, and that's not recommended, and I hope that is not the practice of good operators.

Q. And I guess were you here for the testimony of Mr. Foutz?

A. Yes, I was.

Q. And he was saying that the muds and the fluids that they produce are equivalent to fresh water. Exhibit 5, in looking at this would you consider this to be representative of fresh water?

A. No, sir.

Q. And on Exhibit 10, you are referencing this paper

for nonaqueous-phase liquids, and I think -- I don't know if maybe it was Dr. Neeper or Mr. Brooks was asking about this. You seem to be saying that we can use a saturated level of nonaqueous-phase liquids as indicating a -- whether or not the soil is contaminated enough to leach contaminants?

A. I believe that the paper identifies as a screening criteria to consider, to determine the mobility of those constituents. And I recognize from earlier questioning that you had the concern specifically in northwest New Mexico regarding some of the other constituents that were identified in the contaminants, and I noticed those in my review, and I felt this would be pertinent for the Division to consider and for you to consider regarding contaminant movement.

Q. But you seem to be saying that the contaminants will only be mobile if there's a saturated nonaqueous-phase liquid in it.

A. In a -- I'm not sure that that's exactly correct. I think that the paper indicates that there is a -- there's obviously migration during degradation, because many of these organics change their constituency over time through degradation. And once you change, you know, the hydrocarbon level, it has a higher mobility and it could move.

But typically, that is a volatilization of the constituent, and it would move upward and evaporate, or go to the atmosphere.

Q. But what you're representing to us here is that we should use a saturated level of a nonaqueous-phase liquid in soil as a concentration for essentially cleanup levels or --

A. Yes -- well, not necessarily cleanup levels, but for the concern of mobility, I think, is what the -- you know, if you -- obviously if you had higher saturation levels, that's typically where you would stabilize or you'd take that soil in and mix it with other soil to bring the saturation level down to where it would not be as mobile. And I think this is a reference that indicates some saturation levels for the Division to consider, of those particular constituents.

Q. Well, are you aware that petroleum compounds or -- you know, do not have to have a nonaqueous-phase liquid to have contaminant migration in the vadose zone?

A. Yes.

Q. So why would we use a saturated nonaqueous-phase liquid as a measurement?

A. For movement, given our liner scenario and evapotranspiration, under the current practices of closing a reserve pit, these constituents, in excruciating detail,

have been identified in the trace analysis report, and they may relate back to many of these items that are referenced on the sheet. And it's something to consider from a saturation movement. But those particles break down to different constituents that then become more mobile.

But from a, you know, capillary effect or residual saturation effect, these constituents, at least at the levels indicated in this report, would not be mobile. And I guess that's what I'm trying to offer to the Commission for consideration.

Q. Well, you just said two conflicting statements. You agreed with me that --

A. Well, I --

Q. -- contaminants can migrate in unsaturated soils, and not as a saturated liquid.

A. I mean to say probably vertically through evapotranspiration. You know, it's dependent upon the -- you know, the vapor pressure on the various constituents, whether they're going to be volatile. There's a number of factors.

But I guess what I'm trying to say is that if these constituents are listed at these saturation levels, that they would not migrate down to groundwater. They -- at least from what I can identify, they might migrate in a volatile manner and degrade and move upward.

Q. Do you understand that contaminant migration from petroleum products in the vadose zone is typically by dissolved phase?

A. Yes -- Are you referring to a miscible -- like miscible phase?

Q. I'm talking about a free-phase product put on the ground in some quantity and left there. Migration is largely going to be through dissolved phase migration of the contaminants in the vadose zone.

A. I believe I understand that, yes. It's going to reach -- it's going to migrate until the saturation level of the soil, the dry soil, reaches maybe one of these thresholds, and then it would -- the soil would be fully saturated and the immobile at that concentration. That's how I'm reading this particular reference. You could utilize it in that manner.

Q. But again, you're still saying -- you're saying two different things.

You're saying -- Well, first it's only mobile -- you're agreeing with me that it's mobile in the dissolved phase, but then you say it's only mobile in the saturated phase, so I guess -- I guess do you have any training in vadose zone contaminant migration?

A. No, sir.

Q. Okay. And I guess I was confused on something

you said under some of the cross-examination. It was with Mr. Brooks, I believe. He was talking about the modeling that was done by the OCD came up with an action level of 5000-milligram-per-liter chloride as the -- I guess SPLP leachate, and industry came up with 3500 milligram per liter of chloride.

And you seem to be -- I thought I heard you saying that you're -- you would accept the OCD level of 5000.

A. If I had my choice between the two, I'd prefer the 5000, yes, sir.

Q. But then you don't believe their model is valid, so why do you accept 5000?

A. I believe 5000 is equivalent, but it obviously gives the operator more room to work.

Q. But you're making that on a statement that you don't believe their model is valid. You just like the higher number, I guess?

A. I do like the higher number, I will agree with you, Commissioner Olson.

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

(Laughter)

CHAIRMAN FESMIRE: Mr. Mullins, I do have some questions, but it's getting near noon and we still have to accept comment, and so we're going to hold you over until

after lunch.

At this time is there anyone in the audience who would like to make a comment on the record?

Okay, ma'am, would you come forward and make a comment, please? And we have the option, you can either make a statement of position, or you can make a sworn statement on the record. Both go into the record. One -- the second one is subject to cross-examination. Which would you like to do? And is this going to be a duet?

MS. FARIELLO: Yeah, a duet.

CHAIRMAN FESMIRE: Okay.

MS. TREMPER: And we're not -- we're not going to be sworn in.

CHAIRMAN FESMIRE: Okay.

MS. TREMPER: It's just our position.

CHAIRMAN FESMIRE: Okay, why don't you start by stating your names for the record, please?

MS. FARIELLO: I'm Muriel Fariello, I'm vice president of the Water Users Association for Ranchitos de Galisteo, in Galisteo, New Mexico.

MS. TREMPER: I'm Amy Tremper, I'm a member of the Galisteo Community Association.

Muriel has asked to come today before you and speak on behalf of the two water associations, the Ranchitos de Galisteo and the Galisteo Water Association.

We would like to say we really appreciate all of your hard work. I mean, it's amazing what you've been doing. I've been watching you since this summer when I started coming a little bit. So we appreciate all of your hard work, and I mean all of you.

But second, we'd like to say, and most importantly, Chairman Fesmire, Commissioner Bailey, Commissioner Olson, we support strongly your work to create stronger regulations for open pits.

And that's what we wanted to say.

CHAIRMAN FESMIRE: Thank you, Ms. Tremper.

MS. FARIELLO: We were in agreement on this, it's that we didn't want to take up too much time because there might be other people.

CHAIRMAN FESMIRE: Okay, thank you very much.

Sir, you raised your hand?

MR. SORVIG: Yes.

CHAIRMAN FESMIRE: Would you like to be -- Please come forward. Would you like to be sworn, or would you like to make a statement of --

MR. SORVIG: Yes, I'd prefer to be sworn.

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

(Thereupon, the witness was sworn.)

CHAIRMAN FESMIRE: And please start with your

name, sir.

KIM SORVIG,

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

DIRECT TESTIMONY

BY MR. SORVIG:

MR. SORVIG: Chairman Fesmire, honorable Commissioners, my name is Kim Sorvig. I'm a resident of Santa Fe County and a research professor at UNM. My expertise is in sustainable land use and green building. I've published a standard reference book on this topic, now in its second edition, and approximately 100 articles on related topics.

I consult and speak on sustainable land use issues throughout the United States and internationally, and I'm licensed to practice professionally in New Mexico and by reciprocity in other US states.

Most of what I'm going to say is based on what has been reported in the public media, not on attendance at these meetings, but almost everything is based on published information.

It's my understanding that the purpose of these hearings is to prevent through regulation pollution of water and soil due to surface dumping of industrial wastes and pits.

My purpose in coming here today is to state that if such regulation concerned private individuals or any land-intensive industry, other than the oil and gas industry, these hearings would have a very different tone, if they happened at all.

In particular, there would be far fewer self-serving public claims that the people have no authority through their elected officials to regulate the industry.

Let me give you a few examples substantiating this.

A private citizen cannot dump anything considered toxic or hazardous, even on his or her own property, without facing regulations and fines, nor take hazardous materials to just any dump.

The municipalities that provide landfills are heavily regulated in what may be disposed and how. Those regulations have long banned dumping into anything even resembling an open, unlined pit, and the regulations on how they must be lined, buried and maintained are extremely stringent.

A construction contractor, developer or landowner building a home cannot allow any sediment-bearing runoff to leave the site during construction. That federal regulation, which is called the National Pollutant Discharge Elimination System, Phases 1 and 2, applies to

all projects one acre or larger in the United States.

What we're talking about is sediment derived from clean dirt and rainfall, far less toxic or hazardous than drilling mud or produced saltwater, and yet construction sediment is regulated while the oil and gas industry has lobbied their way to an exception from the NPDES.

Farmers' use of fertilizer is regulated to prevent pollution of ground and surface waters with excessive nutrients. Fertilizer, correctly applied, is a beneficial product. If it's regulated, how can anyone argue that toxic and hazardous by-products should not be?

Carbon dioxide is a necessary part of the atmosphere, but in excessive concentrations it's a pollutant, as federal courts recently ruled. Under pressure from the automotive and oil industries in the Bush administration, as has been widely recorded, the EPA attempted to argue that they had no authority to regulate CO_2 since it was not technically toxic. That argument was struck down, indicating that even fairly conservative courts are tired of assertions that pollutants cannot or should not be regulated.

These examples, in my opinion, add up to a pattern that is directly relevant to these hearings where, as reported in the public press, industry's arguments have amounted to three points.

One is that the state, and OCD specifically, has little or no right to regulate their industry.

The second is that pits and industry practices in general have never caused and could not possibly cause pollution.

And the third is that the industry will be regulated right out of business, to quote *The New Mexican* the other day.

In a time when it's widely documented that the industry as a whole is earning record profits, I won't even dignify that third point with commentary. But I do wish to comment briefly on the other two.

I've already stated that farming, construction and most other major land-consuming industries are regulated to prevent pollution and have with greater or lesser degrees of grace accepted regulation as part of their responsibility to society. A large plurality of Americans approve of regulations to protect the environment, human health and private property rights. The legitimacy of such regulations has stood up to innumerable court tests. Fewer and fewer industries fight every attempt at regulation, and fewer of them resolutely insist that they damage they do is always somebody else's problem.

Indeed, in the past two decades, the manufacturing industries in general have made major strides

in containing and recycling wastes and increasing energy efficiency, which decreases pollutant emissions. In fact, many industries have turned sustainable or green processes and products to their commercial advantage. These green industries already produce $230 billion annually in the United States as of the late 1990s, and more than twice that worldwide. Many of these green industries have been growing at five times the rate of the national economy for many years. As a single example, the green building industry is one of the fastest growing subsectors of the New Mexico economy.

Thus, from the broad perspective of actual practice in land use and in industries large and small, the oil and gas industry's attempts to deny the right to regulate them is exactly that, denial.

There is another path, another attitude, and the oil and gas industry could take it. Thus far, they seem to be choosing a belligerent attitude and defensive spin-doctoring, as well as the kind of evasion of questions that we see in this hearing.

That leads to their second argument, that nothing the oil industry has -- does, has caused or could cause pollution.

The State of New Mexico has documented something like 800 instances of groundwater pollution from oil

industry waste dumping. In flat contradiction to that, the mouthpiece of the New Mexico oil industry has repeatedly stated to the press that not one gallon of water delivered to consumers has ever been polluted by oil drilling. It's directly relevant to these hearings, but also typifies the attitude.

By introducing those three weasel words, delivered to consumers, the statement is true of commercial water delivery systems who, of course, cannot risk the liability of delivering contaminated water to consumers. But the half truth excludes contamination of the groundwater wells on which rural and agricultural New Mexico rely and which I have to assume are the subject of the State's documented evidence.

This is not an isolated case. In proposing drilling in Santa Fe County it's been repeatedly asserted that there's no possibility a well casing could leak. That was said of the *Titanic* as well.

A final national example of this systematic distortion of truth is relevant. The Union of Concerned Scientists has documented that ExxonMobil spent over $16 million to buy fraudulent, quote, unquote, research, to create doubt and confusion about the reality of global warming. I've attached references to that, to my written submission.

Although no one is accusing the New Mexico oil and gas industry of that level of spending, ExxonMobil's tactics are virtually identical to the attempt to plant the idea that pit disposal of drilling wastes is harmless, or that casings and frac'ing couldn't possibly go bad.

As much as anything, these are matters of attitude. That attitude was typified for me in this room earlier this week when a woman in pearls and a very expensive suit sat in the back and snickered through the testimony of a world-renowned professor of business management who spoke on the necessity for industry to bear the social costs of their operations.

It was also typified when on the air, the same industry mouthpiece stated that he didn't think ethics entered into this problem at all. Exactly the problem, as the rest of us see it.

The good news is, however, that attitudes determine outcomes. And by now I'm quite certain that all the oil and gas people in the audience think I'm just here to attack them, and that's not actually the case.

What I hope to do is suggest that the industry's defensiveness is blinding all of us to positive alternatives.

Here's a simple example of how changing attitude could change out come.

As things stand, the oil and gas industry takes the attitude that society, through its government agencies, is unfairly targeting them. The result of that attitude is adversarial processes and hearings. The outcome of that is that at best, pit waste will be trucked to expensive approved dumps. This costs the industry, as has been pointed out, and the state. It does entail some unresolved risks. And it only half-solves the problem that society through its representatives wants solved.

Please don't misunderstand me. Controlled dumps are better by far than abandoned pits. But although they better protect the public, financially they're a cost without any return to any of us. Why not think outside the box and create a whole solution instead of a half one?

The term closed-loop systems is also used in the chemical manufacturing industry, one of the few industries bigger than oil and gas and one that's working to overcome a terrible track record of pollution. To chemical manufacturers, the term means reusing and recycling industrial by-products, many of them toxic, into safe and valuable products.

If we follow their example and think outside the box, drilling by-products that are too hazardous to be dumped are not merely waste, they're potential resources, if properly re-processed.

What if the loop were fully closed so that these materials were trucked not to a dump but a manufacturing facility? BAS Agfa, the huge chemical corporation, for example, has turned this concept into cost savings, new products and new markets.

So my purpose here is twofold: First to support the OCD in banning pit disposal and protecting the environment, but not as a punishment of the oil and gas industry, rather as an incentive to creative and positive enterprise. As the representatives of the people, OCD clearly has the right and the reasons to regulate pit waste. More importantly, however, if OCD makes it impossible for industry to treat their by-products as somebody else's problem, perhaps the industry will get creative and turn that challenge into a sustainable and responsible side industry.

Secondly, I want to urge the oil and gas industry to take that step outside the box. Quit wasting money on attack dogs and spin doctors, on obstructing the people's absolute right and responsibility to regulate, govern and protect product public health and safety. Your expensive and defensive mouthpieces make you look bad. Worse, they distract everyone from ever thinking together about these issues.

I urge you to make a better investment. Follow

the example of other industries who have owned their responsibilities and turned them into assets.

I want to reiterate that although a simple ban on pits may only be a half step, it's a step we must take.

Once pits are banned, it's the industry's choice as to whether they continue to bite and scratch, or whether they rejoin the world of responsible corporate citizenship.

Thank you.

CHAIRMAN FESMIRE: Thank you, professor.

Are there any questions of this witness?

MR. BROOKS: No questions.

MR. CARR: No, sir.

MS. FOSTER: No, thank you.

CHAIRMAN FESMIRE: Thank you very much, professor.

THE WITNESS: Thank you --

CHAIRMAN FESMIRE: Is there --

THE WITNESS: -- for your time.

CHAIRMAN FESMIRE: -- anybody else? Thank you, sir.

Yes, sir, why don't you come forward, please. You know the options.

MR. SCOTT: Yes

CHAIRMAN FESMIRE: Okay. And would you like to make a statement of position or make a sworn statement?

MR. SCOTT: I'll be sworn.

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

(Thereupon, the witness was sworn.)

LARRY SCOTT,

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

DIRECT TESTIMONY

BY MR. SCOTT:

MR. SCOTT: Mr. Commissioner, my name is Larry Scott. I'm a partner in Lynx Petroleum, a southeast New Mexico oil and gas producer with 50 wells exclusively located in Lea and Eddy Counties in New Mexico, a very small company by any standards.

We drill between one and three wells a year. For the last few years those have been Morrow gas development projects in the 10,000- to 12,000-foot range.

My last well was with a conventional reserve pit. The well before that, north of Carlsbad, New Mexico, was drilled with a closed-loop drilling system. And my own experience was, our additional costs were approximately $150,000.

This was 8 percent of the total cost of the project, and it represents -- if the new regulations are approved, it represents an 8-percent institutional cost to

the industry in southeast New Mexico that I believe -- well, conservatively estimated, a total cost based on rig count, number of wells in the southeast, our industry cost would run between $58 million and $200 million per year, depending on whose estimates you use, with regards to how many wells a rig can drill.

CHAIRMAN FESMIRE: Is that just in the southeast or the whole state?

THE WITNESS: No, sir, that's Permian Basin, southeast.

CHAIRMAN FESMIRE: Okay.

THE WITNESS: It represents about a 45 rig count, which was slightly below the 2007 average to date.

I don't believe our industry is fighting these issues on the basis of being for pollution. I think what we are trying to accomplish here is to have this tax -- this $58 million to $200 million tax, that we would gladly pay if it was demonstrated that it does any good.

Commissioner Olson was asking early in his questions about -- you know, it's up to the industry to prove that we're not polluting the ground with these activities, and I think the proof comes with a 70-year operating history in southeast New Mexico, with the number of instances of pollution limited in the extreme, and the vast majority of those not attributable to reserve pits.

I think everyone here will agree that in the '20s and '30s and '40s, our operating practices were substantially different than they are today. I have anecdotally heard of open water disposal pits acting as oil and gas separators for volumes of fluids that are nowhere near, over a log period of time, what we're considering with a 15,000-barrel reserve pit that's in use for 30 days.

We don't know. There has been no extensive research performed by the state, by private industry, as to the extent of the -- of the damage that a properly closed reserve pit does over a long period of time.

From my experience in the field, these locations are undetectable on the surface. I have over the last 25 years been involved in several re-entry projects where we've been out looking for a wellhead, to go back and try to re-establish production. And before the advent of GPS receivers, it was in many cases difficult to find them. They've just been re-vegetated and not -- and they're not visible to anyone's eye.

Our advocacy would be to generate some data, to develop models that everyone can agree are appropriate to the task, to perhaps get on the ground with test wells around some of these old improperly closed pits to determine the depth and extent of the contamination. It's my opinion, and the opinion of many that I've spoken to,

that that will demonstrate that there isn't any risk to the public.

And before you enact a tax in the amount of $60 to $200 million per year, we should be -- we should be aware that that tax is deriving -- at least a portion of that, in benefits to the people that are -- of New Mexico, because we are such an important industry.

I believe that the uncertainty currently associated with the regulatory environment in our state has already had an effect, a chilling effect, on our level of activity. I'll give you a for-example.

The Permian Basin side of west Texas, in 2003, had 98 rigs running. In 2007 the average was 220.

In New Mexico, the New Mexico side of the Permian Basin where our reservoirs and geology are substantially similar, New Mexico had 52 rigs running in 2003 and the southeast had 55 running in 2007.

The increase in Texas is 224 percent, the increase in New Mexico is about 5. The data in October of this year indicated 47 rigs running.

Now, if we discount the $50 to $200 million impact that is our direct cost and we say that this affects the southeastern portion of the state in terms of economic activity, and that without this uncertainty, we would have 25 to perhaps 50 more rigs running, the economic impact to

our portion of the state is upwards of $700 million. And that's confined to Lea, Eddy and Chaves Counties.

Before you enact these new regulations, please take into account the people in the southeast corner of the state and how they will be impacted by your decisions.

And that's all I have. Thank you.

CHAIRMAN FESMIRE: Are there any questions of this witness?

MR. BROOKS: I think I have -- yeah, just a couple.

CROSS-EXAMINATION

BY MR. BROOKS:

Q. Mr. Scott, your figures that you computed for the total impact on the industry, were those based entirely on your -- this one well that you had experience with, that you --

A. I'm saying that's -- my experience would be represented.

Q. You just took the costs that you incurred in that particular well --

A. That's affirmative --

Q. -- and extrapolated that over all the wells --

A. That is --

Q. -- in southeast New Mexico?

A. -- affirmative.

Q. Okay. Was that well a commercial well?
A. Yes, sir, it was.
Q. Even given the additional costs?
A. No, sir.
Q. It was not, with the additional costs?
A. No, sir. In fact, this well would not really be an economically successful project, even without the added cost of the --
Q. Okay, so this --
A. -- closed-loop systems.
Q. -- was not a commercial well?
A. Well, it's commercial, but commercial and economic are two different definitions.
Q. Okay, now I guess --
A. All right --
Q. -- I'm getting --
A. -- by commercial --
Q. -- caught in --
A. -- I mean, is it --
Q. -- terminology.
A. -- producing oil and gas in commercial quantities?
Q. Okay.
A. Yes.
CHAIRMAN FESMIRE: You're producing to minimize

your loss, I guess, is what --

THE WITNESS: That is exactly --

Q. (By Mr. Brooks) I have heard the term commercial well to mean one that is producing sufficient quantities to yield a profit over the long term -- the productive life of the well.

A. My definition is month to month --

(Laughter)

A. -- but it will not return the total investment in the project.

Q. Okay, thank you. Were you here when -- when Mr. Hansen testified?

A. No, sir, I was not.

Q. And so if he testified that even with an unlined pit, and assuming 50 feet to groundwater, it would take 70 years before contaminants would show up in a well on the down --

MS. FOSTER: Mr. Chairman, I would object.

CHAIRMAN FESMIRE: To -- ?

MS. FOSTER: This witness hasn't stated he's a hydrologist, he hasn't stated any expertise other than that he is a small business owner, and I believe that the tenor of Mr. Brooks's question really does get into the specifics of modeling and hydrology.

MR. BROOKS: Allow me to rephrase the question,

Mr. Chairman.

CHAIRMAN FESMIRE: I'll sustain the objection. Please rephrase the question.

Q. (By Mr. Brooks) You testified that the best evidence for the oil and gas industry's record was a 70-year history?

A. Yes, sir.

Q. Do you know how long it would take for pollution to show up in groundwater if it, in fact, was migrating?

A. No, sir, I do not.

MR. BROOKS: Thank you, that's all I have.

CHAIRMAN FESMIRE: Any other questions of this witness?

MS. FOSTER: Actually I do have one question.

EXAMINATION

BY MS. FOSTER:

Q. Mr. Scott, in your $150,000 cost for your closed-loop drilling, did that include the cost of hauling your cuttings off?

A. Yes, it did.

Q. Thank you.

A. Now our project was relatively trouble-free. I can address the problems that we might encounter with a closed-loop system in the event that well conditions were not as expected, two things that we routinely -- routinely

might be a strong word -- two things that we encounter in the southeast in areas of mature waterfloods. Drilling in those areas, we will occasionally encounter a waterflow.

Obviously with the limited storage, liquid storage capacity on location, in the event of a waterflow that problem is severely exacerbated. It makes almost unmanageable.

And then the other problem that we occasionally face is one of lost circulation. And in those instances we slow the rig pumps down to something on the order of 200 gallons per minute. But once again, with limited fluid storage capability on location, the operational difficulties are significantly magnified.

MS. FOSTER: Thank you. I have no further questions.

CHAIRMAN FESMIRE: Mr. Carr?

MR. CARR: No, sir.

CHAIRMAN FESMIRE: Commissioner Olson?

EXAMINATION

BY COMMISSIONER OLSON:

Q. Well, I just wanted to make sure I understood your figures. I think Mr. Brooks was asking you about that. You said that $58 million to $200 million is based on all wells being drilled with closed-loop systems?

A. That's affirmative.

Q. And so -- But do you understand that the rule doesn't require that all wells be drilled with closed-loop systems?

A. Yes, sir, I do.

Q. Okay. That's just the worst case --

A. That's --

Q. Okay. Then you were -- mentioned the rig count. Did I get that right? You said in 2003 the rig count was 53 in the southeast, and in 2005 it was 55?

A. No, I believe that was -- I believe that was just the opposite. 2003 had 52 rigs running --

Q. Oh, 52?

A. -- 2007 had 55 rigs running. October 10 of 2007 I believe there were 47 active rigs in the southeast.

Q. And I guess for a large period of that time, though, there was no proposed rules coming forward, so why wasn't the rig count increasing then?

A. I believe -- of course, it's hard for big oil companies, big oil companies, to change course. And I believe the uncertainties that are associated with these proceedings have caused many of my contemporaries to take a look at the state, decide that, you know, perhaps they might go someplace else for the time being, until this is sorted out.

Q. These rules weren't proposed until last year, so

why wasn't the rig count increasing before that?

A. Actually, the rig count in New Mexico last year was 77.

Q. Oh, it was, okay.

A. Yes.

Q. Okay.

CHAIRMAN FESMIRE: But that's the whole state, that's not just the Permian Basin?

THE WITNESS: No, sir, that was -- that was Permian Basin.

CHAIRMAN FESMIRE: What's the rig count now?

THE WITNESS: In Permian Basin?

CHAIRMAN FESMIRE: Yeah.

THE WITNESS: 47 on the New Mexico side.

CHAIRMAN FESMIRE: Okay.

COMMISSIONER OLSON: Okay, thanks.

THE WITNESS: Thank you.

EXAMINATION

BY CHAIRMAN FESMIRE:

Q. Of the hundred and -- I've got a couple of questions, I get a chance. Of the $150,000, can you give us a breakdown on what the incremental costs were?

A. Mr. Chairman, I did not bring that number with me. It included the solids-removal equipment, the additional tankage that was required on location, and the

transportation charges to get those solids and the operation to the approved disposal facility.

Q. Why did you use the closed-loop system?

A. Well, that's another story.

(Laughter)

A. I originally -- it's federal land --

Q. Well, let me tell you, if you go past 12:30, we'll probably have to go to lunch till 2:00, so go ahead.

(Laughter)

A. I originally attempted to permit that well with a conventional reserve pit, and it was on Bureau of Land Management Land, 4500 feet from the Pecos River. And there's a fairly significant lag time between when you submit the paperwork and when it gets reviewed, and we were well into that lag time with my drilling rig availability approaching.

And I started making phone calls to the Bureau of Land Management in Carlsbad to determine where my permit was. And one of the gentlemen that I finally talked to -- and it was in his shop, and he was a -- was a wildlife specialist. And he said, Larry, we want you to drill this with closed-loop system.

And I said, What are your concerns? And can I address them in another manner?

He said, Yeah, if you'll -- if you'll net the pit

and de-water it immediately upon the completion of your operations, I'll let you put the reserve pit in.

Great.

Three or four more days went by, perhaps a week. My rig availability is getting closer, and I -- once again, I don't have a permit in hand, so I'm back on the telephone.

I called and this time was put in touch with a cave/karst specialist who now had my APD for review. And he said, Larry, you're going to have to drill with a closed-loop drilling system, or we'll allow you a cuttings disposal pit on location with mechanical solids removal equipment. You can't use any fluids in the reserve pit.

You know, once again I commenced to question the need for that requirement.

And what I ended up with was -- and we were in an area surrounded by existing production. But what I ended up with for the reason for that expenditure was, I feel like over time that reserve pits will just have to be detrimental to groundwater resources.

Groundwater at this location was 197 feet. He could provide not one scientific study, a paper or any sort of written justification whatsoever. And I asked on several occasions if he had anything of that nature available.

And at the end of the day we expended those funds on the basis of his opinion, his feeling that we were eventually going to damage groundwater resources.

And as a small businessman, it is terribly frustrating to be faced with such arbitrary decision-making from regulators. I really was disappointed in where we got to there.

But -- drilling rig moving in, and I think at that point, seven, eight, ten days, you know, what we had left available to us was closed-loop, and the equipment was available.

Q. Okay. Now the Morrow in New Mexico is pretty prolific, isn't it?

A. It has been, yes.

Q. If you hit the channel?

A. That's correct.

Q. Okay. What's it like in Texas?

A. There is very little Morrow production in Texas. It's something else.

CHAIRMAN FESMIRE: I have no further questions.

Any other questions of this --

COMMISSIONER OLSON: Just --

CHAIRMAN FESMIRE: Commissioner Olson?

COMMISSIONER OLSON: -- follow up, want to make sure I had something correct.

EXAMINATION

BY COMMISSIONER OLSON:

Q. You're saying there was a $150,000 extra cost. Was that just the cost of using the closed-loop system at your disposal, or was that the incremental cost over --

A. No, Commissioner, our estimate was, that was the incremental cost --

Q. Over using a --

A. -- over a conventional

Q. -- reserve --

A. -- reserve pit, that's correct.

COMMISSIONER OLSON: Thanks.

CHAIRMAN FESMIRE: Any other questions of this witness?

Mr. Scott, thank you very much.

THE WITNESS: Thank you.

MR. CARR: Mr. Chairman, before we recess could I ask if there has been a decision on a briefing schedule? Because if we're running out of time, I have to during the noon hour issue a call.

CHAIRMAN FESMIRE: Why don't we go ahead and adjourn until two o'clock, but I'd ask the attorneys to stay behind, and we'll talk about scheduling and the briefing schedule.

(Thereupon, noon recess was taken at 12:34 p.m.)

(The following proceedings had at 2:02 p.m.)

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

The record should reflect that this is Case Number 14,015, that all three Commissioners are all present, that a quorum is therefore present, and that we're reconvening after lunch at two o'clock on Friday, November 30th, 2007.

We were in the middle of the cross-examination, or hopefully towards the end of the cross-examination, of Mr. Tom Mullins.

Mr. Mullins, I was the designated examiner. Are you ready to begin?

MR. MULLINS: Yes, sir, I am.

THOMAS E. MULLINS (Continued),

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

EXAMINATION

BY CHAIRMAN FESMIRE:

Q. Now you made a statement early in your presentation. You said labor is a challenge always. What did you mean by that?

A. Finding skilled labor in the oilfield, as I think in many industries, is a challenge. In particular, our industry faces some significant drug screening and liability testing, and that's gotten more restrictive the

past few years.

And in fact, one particular operator is instituting their own drug-tracking program, almost a big brother program, which is different from previous reporting, tracking via Social Security numbers, so that employees that might have failed a drug test in the oilfield and previously gone to work for another employee, another company, and potentially ended up on the same work site, now they're trying to actually address that level.

So it's getting challenging to find skilled employees that can meet all the requirements for labor.

Q. Now I'm going to talk about -- get into your expertise as a drilling engineer, and one of the things I'm going to talk about is the difference between conventional drilling and air drilling. But I want to talk about the mechanics of tri-cone bit drilling.

At the bottom of the hole you've got the bit, you've got the fluid coming through the bit, through the jets in the bit. Right?

A. That's correct.

Q. Okay. And you've got a certain pressure in the wellbore from the fluids, a dynamic component and a static component to that pressure, right?

A. Yes, I think they refer to it as jet impact force.

Q. Right. Now as the bit turns on the rock in the bottom of the hole, what happens to -- what happens at the bottom of the hole?

A. In liquid -- liquid-drilling scenario, the roller cones remove the initial surface are, and then the jet impact force from the bits actually impregnates and helps drill the hole, and then the roller cones actually remove that top layer. So it's kind of a combination of events.

But bit hydraulics affect the -- you know, the drilling parameters.

Q. What happens to the rock as you remove the lithostatic pressure, as you grind the rock up above it? What happens there?

A. As you grind the rock up -- and again, it's a function of your penetration rate and your bits -- it turns into drill cuttings, and that material typically, in regular drilling operations, comes up the annular area, the distance between the drill string and the outer hole or the casing and comes to the surface.

Q. Okay. So what happens in air drilling in that process?

A. Actually, there's some -- there's a couple different beliefs regarding drilling with air. Some people actually believe that the rock itself, and the pore pressure within the rock as the roller cones would remove

that surface area, it effectively will --

Q. -- implodes --

A. -- implode --

Q. -- into the hole?

A. -- implodes into the hole, because the -- there's not really a jet impact force from the bits --

Q. Because of the fluid viscosity --

A. Yes --

Q. -- the fluid mass?

A. Yes.

Q. Okay. So if you disturb that rock or remove the lithostatic pressure, it essentially breaks itself up and wants to move into the hole, right?

A. That would be one way to describe it, yes, sir.

Q. Okay. What happens when you dig a pit? You come into a pit and disturb the lithostatic pressures and the lithostatic forces that have reached equilibrium prior to your disturbing it?

A. Well, I guess in digging a pit the hope would be that we're not -- we're drilling in a -- I guess a nonsaturated environment, digging a pit up at the surface. So the fluid contents of the pore space are typically quite different with regard to digging a pit mechanically, let's say, with a bulldozer or a backhoe piece of equipment.

So it's different, somewhat, than drilling the

hole. Obviously, probably during the top phase of, you know, drilling the surface hole there may be some similarity, but --

Q. Okay. But in digging the pit, the point I'm trying to make is that you come in and you disturb that soil, that gravel, that rock structure, that lithostatic structure that's there, right?

A. Of the hole, so yes, I would say it's probably similar to drilling a hole in that standpoint, if that's what you're asking.

Q. Okay. Can we look at Exhibit 9 on the third page?

A. If you could help me with -- since I'm afraid --

Q. That's --

A. -- my copies don't have an actual title, so --

Q. That's the USGS report.

A. Okay, the USGS report from Nevada.

Q. Right. And on the left-hand column on page 3, the third paragraph down -- there's a part of a paragraph, a whole paragraph and then the third paragraph. It starts with the sentence, Little is known about how or, or to what degree, features of the natural system may be altered by installation of a disposal facility.

They're talking about holes and pits and things like that; is that not correct?

A. I'm trying to find that page, sir, I apologize. You said it's on page 3?

Q. Page 3, on the left-hand column, the third paragraph down.

A. Left-hand column. Yes, sir, I see that language.

Q. Okay. And would you agree they're talking about pits and things like that?

A. Yes, I believe they refer to since they began their project in 1987, yes, sir.

Q. Okay. So the question I'm asking is, doesn't that result in a change in the hydrologic profile of the vadose zone?

A. I think the article and the information indicates that in a disturbed area -- that there's a difference in that disturbed area. But with regard to the vadose zone underneath the disturbed area, I wouldn't see where that would be impacted.

Similar to where you were drilling a hole and you were 50 feet below your interval, I don't see the -- you know, an impact beneath that point.

Q. Okay. But the hydrologic profile of the zone immediately under the pit is going to be disturbed by the very action of creating the pit, will it not?

A. You know, I don't know that, beneath the pit. But you know, within the pit area -- and I -- that area

that has been disturbed, you know, the flow effects would be different.

Q. Okay. Now your company, Synergy, it's a nine-person company?

A. We have nine people working in our consulting division, which are wellsite consultants that perform work, primarily for ConocoPhillips currently, in the basin. And then we have six employees in our production company side of the business.

Q. So let's just talk about the production side of the business. Typical small business in New Mexico, right?

A. Yes, sir.

Q. Typical small business in the oilfield in New Mexico?

A. I would say yes, we're one of the -- a reduced number of independent producers. It seems to be there's more mergers every day, and the business is getting more challenging, so...

Q. Okay. And if my math is right, the shallow wells that you drill, you described them as being -- you are a marginal -- I hate to repeat this because this may not be exactly the phraseology you used -- you are a marginal producer dealing in incremental areas?

A. Well, the San Juan Basin in particular is a -- I've heard this term used, that it's locked up by the

Mafia. And with regard to that, that --

(Laughter)

Q. Do you want to go on record as saying that?

A. In the humorous way I guess what that means is, the folks that have the leases and the acreage, because the Basin has been in existence for such a long period of time, it's very landlocked. You will not see a large number of leases coming up for sale.

Q. Especially not large blocks of leases?

A. Typically not, except in what would be the fringe areas of the Basin, such as we're -- we have been able to obtain some of our leasehold position, yes, sir.

Q. And so I don't say this pejoratively but it is a real phrase in the oil and gas industry: Your company's what you'd call corner-shot artists, aren't you?

A. You know, I haven't heard of that term, corner-shot artists, so I'm not familiar with that.

Q. Okay. But you would describe your business as on the fringes, on the margins, sort of an incremental producer?

A. We've taken pride in taking over properties from other producing companies that have -- specifically ConocoPhillips in a couple -- a three-well instance, and then Questar also in the Paradox Basin where we've been able to acquire properties that were basically plugging

liabilities and rework that from the independent methodology.

And I think you'll see that just in general, that's been the way oil and gas has been produced in our business, is that you'll have an independent company with an idea take that risk, go out and try a technique, and that will be followed, typically, by being acquired by a larger major company for the development phase of the operation.

Q. Okay. So your operations involve basically coming in and using superior knowledge of the Basin, of the zones and things like that, to increase production that others have missed or didn't develop for some reason?

A. We've been fortunate with our technical knowledge that we've been successful taking advantage of that. But I've worked the entire fairway area in my career, and I would obviously prefer to have better geological rock to develop than what we have in most of our portfolio.

Q. Okay. And talking about your portfolio, it's your testimony that the costs here associated with the proposed rule will increase your costs about $35,000 per well, right?

A. Yes, specifically regarding our shallow -- our shallow development, that's correct.

Q. Okay. And some of the things that Mr. Brooks

talked about, you know, he had an argument about whether that was a true incremental analysis. But notwithstanding that argument for right now, you think that it's going to cost you about $35,000 more per typical well?

A. That's my estimate based on not having actually done a closed-loop on that particular project area, that distance from, you know, Farmington or a disposal facility, just analyzing the rule as it's proposed and my experience. That's what I believe the incremental costs would be.

Q. Okay, and those costs would reduce your DCF rate of return by about five percent per location; is that correct?

A. With regard to DCF, meaning discounted cash flow, yes. And I forgot on Tuesday, I believe, to mention that those were before income tax numbers with regard to the economics, those were not after income tax numbers.

Q. Okay. So you're going to decrease your rate of return from about 29 percent per year per well to -- or per project, to about 24 percent?

A. That's correct.

Q. Okay. Now, if you were to do the incremental economic analysis, and if you were to do it after tax, this $35,000 is going to be an intangible drilling cost, right?

A. That's correct.

Q. Okay, and how are intangible drilling -- I'm sure

you know the answer to this one. How are intangible drilling costs handled for tax purposes?

A. Well, typically intangible drilling costs are handled on a direct expense basis. I was prepared for your question, Mr. Chairman, and I reviewed this subject with our accountant, who is a CPA.

For the last two years our particular situation is that there's this unfortunate tax structure called the alternative minimum tax --

Q. Right.

A. -- and our particular company has been unable to utilize the deductions that would typically be represented with regard to a normal ex- -- immediate expense.

Q. But as your company matures, you will grow out of that, won't you?

A. Again, the alternative minimum --

Q. You will hopefully grow out of that?

A. The alternative minimum tax has an escalator associated with it. It is our hope -- obviously, we contribute a large amount to the tax revenue of the state and federal government for our size of company.

Q. And in fact, you can structure your deals so that you can transfer that IDC credit to investors, can't you?

A. Some organizations do that. That would be, I guess, one marketing area for our project. You know, this

specific project is not a proven reserve category. Hence, the great difficulty in obtaining financing to develop it.

Mr. Foutz had testified to some 80-acre infill proved development locations. Those type of investments would be more easily -- you would more easily obtain financing there.

Q. But for most companies the intangible drilling cost portion, which in this case is going to be 100 percent of the incremental cost, is going to make it look better than the pre-tax economic evaluation, isn't it?

A. It actually -- I have the -- I looked at my after-tax economics, and you don't -- you do pay taxes. Our current tax rate we're currently paying is a little over 30 percent, effectively.

There have been various articles indicating we -- the industry has a free ride on paying taxes. I haven't noticed that personally. I don't know if that's correct. Each company is going to have its own individual tax basis. From a C corp basis, my understanding is yes, your answer is correct. Many independents, though, are not C corps, they're --

Q. Okay.

A. -- they're small businesses.

Q. So you -- by incurring the costs associated with the proposed rule change, you will be reducing your before-

tax rate of return from 29 percent to 24 percent on a typical project?

A. On this specific project related to the shallow Fruitland development, that would be correct, sir.

Q. Okay. Do you think that result will be typical of most operators in the northwest?

A. I think that it would actually be compounded to a greater degree. The average well depth in the San Juan Basin is greater than 1000 feet, and I believe some of the other witnesses had offered some specific cost testimony regarding that.

I do know that I got a little choked up or emotional the other day, and it's because I -- I'm spending this money, this estimated $35,000. That's coming out of my direct pocket, there's not an illusionary company or till that you go reach to, to grab this extra money. And looking at our financial condition, I see the rule as written as being an impact to us.

Q. Okay. Now talking about that thirty- -- was it $35,800? I don't have it open to that page.

A. I believe that -- it was Exhibit 4, if I memorized correctly, and it was approximately $35,000, yes, sir.

Q. And you understand that there's been some testimony that, for instance, closed-loop systems would

reduce the amount of wastes that you would have to haul and dispose of, and that that would, you know, change some of the numbers -- and that there is some argument that that would change some of the numbers you presented there, right?

A. Yes, I'm aware of that testimony.

Q. How do you define DCF rate of return for me, that we were talking about?

A. How do we define discounted cash flow rate of return?

Q. I'll tell you what, since I looked it up I'll go ahead and define it and see if you agree with me.

A. Okay.

Q. It's that rate of return at which the net present value of the money remaining in the project equals zero, right?

A. Discounted cash flow rate of return. Well, you would hope it would be above zero, but yes, that's what you're looking for --

Q. The net present --

A. -- right, the rate of return figure based on that is --

Q. So that's the rate of return on the money remaining in the project, right?

A. Correct.

Q. Now you described some types of risk. One of them was regulatory risk, and that piqued my interest. Could you talk about that a little bit more?

A. Yes, I can. In looking -- As an independent businessman, we have properties in Utah, Wyoming and New Mexico, and we've acquired leases many times on the fringe or the marginal areas of the basin, based upon the regulatory environment that's in place at the time we acquire the leases. And we make estimates, you know, prior to the lease, how much oil and gas we think is there, what the drilling cost might be to develop that.

Regulatory risk in our instance today -- and with the matter of the hearing -- is that we have the shallow play, in particular, that we had identified could be developed, and the regulatory risk in the rule as proposed appears to add an additional cost basis to it, which factors into the end result being the full economic risk of the project, whether you are willing to take the full economic risk, given all the parameters.

And so that's what I mean, I guess, with regard to regulatory risk on the shallow drilling.

From the standpoint of acquiring properties, the proposed rule with regard to below-grade tanks, if there's a number of properties that we have an opportunity to acquire -- and we've factored in our cost, and again,

typically it's very challenging to acquire properties in the landlocked basin.

You need to be aware of the regulatory regulations. If you're not, you could acquire those properties regarding the proposed rule and find out you have a significant expenditure with regard to your below-grade tanks on the rehabilitation. So that would be a factor that, you know, we had not addressed if you were not up to speed on the regulations.

So it's -- you know, it behooves you to have a full-time regulatory person on your staff to keep up with the changes in regulations.

Q. Okay. Now we hadn't talked -- you hadn't talked about below-grade tanks before. What do you see as the problem in the proposed rule on below-grade tanks?

A. You know, that is not my specific area of expertise. The concern, I guess, that I see -- in fact, I didn't even identify that in my initial letter; it must have slipped my review -- is that industry as a whole -- and many companies have expended a large degree of money to try to improve the collection of produced water, fluids.

Many of these below-grade tanks you drain from an above-grade tank into that via gravity in order to remove the water cost-effectively, so that you can have your condensate hauled, or your oil hauled. And so in that

regard, a large amount of investment -- I believe in the early '90s when the effort was put in, it was estimated there were 60,000 production pits, in excess of 60,000, in northwest New Mexico. And I believe, you know, there's been a great deal of effort from industry to basically remove the majority of those earthen production pits. And so having to go back and do some additional work under a very confined time frame would be very challenging and very costly.

Q. Now, you said that isn't your area of expertise, and if I get into that and you don't feel comfortable talking about it, tell me. But I guess industry objects to the proposed definition of below-grade tanks, right?

A. My understanding is that there was a change in the definition of what a below-grade tank was between the task force and the actual rule as it was written, that has a significant impact upon the industry, and that that would be a concern for the Commissioners to address in an equitable manner.

Q. Okay. And somebody else later will talk to us about that?

A. I'm assuming the industry committee will be presenting that. I think we were originally at the end of the witness list.

Q. Okay. Now you said you had used a closed-loop

system, but said you hadn't used a closed-loop system in this particular reservoir or this particular field; is that correct?

A. Well, no, I've actually -- I've actually installed closed-loop equipment on -- being a centrifuge, in particular, equipment in the San Juan Basin and drilled five wells with that particular item, and we utilized the reserve pit to contain the solids in that particular instance.

I've also been out on site on the Merrion operations. They're actually drilling very near our office building in Farmington, and so I went out repeatedly to analyze their well site and to see the operations.

And then I've also participated as kind of an advisor on several wells that were drilled down along the San Juan River with, you know, that closed-loop equipment.

Q. Now you made a statement that again sort of piqued my interest. You said you hadn't identified any groundwater contamination in the northwest.

Do you remember when people were saying that, that they hadn't identified any groundwater contamination at all in New Mexico, and then they hadn't identified any in -- from drilling the workover pits? Do you remember those two statements?

A. Well, I remember -- I've reviewed the data, and I

remember stating that with regard to drilling temporary drilling workover pits in northwest New Mexico, that specifically, that there had not been a case of groundwater contamination that I had identified or seen in the records.

I'm aware of several cases that the Oil Conservation Division has related to production pits.

Q. Okay. And you've seen the evidence here that there are at least 10 cases in the southwest in the last year and a half of groundwater contamination from drilling and workover pits, haven't you?

A. I saw the testimony earlier in the southeast portion of the --

Q. I'm sorry, southeast.

A. -- of the state, that there were 10 cases under investigation. But not having had an opportunity to look at the depth or the degree, you know, I don't have any other information on that.

Q. Let's go to Exhibit 4. I think I can back-calculate from what you said, but what is the total cost, total completed cost, of the well on Exhibit 4?

A. My Exhibit 4 is our shallow Fruitland Coal well example, and I had -- the total cost on that particular project is $275,000 per well. That's my estimated cost, or current AFEs.

Q. So we're looking at an incremental cost of about

15 percent, if your $35,800 is correct, right?

A. Total cost being $275,000, the new cost being $310,000, so it would be in the neighborhood of 10 percent.

Q. Ten percent.

A. Yes, sir.

Q. That corresponds pretty closely to Mr. Scott's 8 percent on a deep Morrow well, doesn't it?

A. I believe so, yes, sir.

Q. So we're looking at increasing the costs, at first, if these numbers are correct, between 8 and 10 percent per well?

A. His example in the southeast and my shallow-well example in the northwest, you know, there's some difference between availabilities of equipment in the --

Q. Right.

A. -- respective areas. But yes, your statement is correct.

Q. So -- and between your 600- to 900-foot coal wells and his -- we forgot to ask him how deep Morrow well, but I'm going to assume somewhere between 9000 and 13,000 feet, we pretty well run the gamut in New Mexico, don't we, with those estimates?

A. There's a great deal of variability, yes, and that's what Mr. Small's testimony -- he tried to give the Commission a representative example of that.

Q. Okay. But the point I'm trying to make is, yours are about as shallow as they come, and his are just about as deep as they come, don't they?

A. That would be a reasonable statement, yes, sir.

Q. Let's go to Exhibit 10, the API Soil and Groundwater Research Bulletin.

A. Yes.

Q. And I haven't had a chance to read it, so this is a true question. But from looking at the chemical analyses, we're looking at a refined product, aren't we?

A. Typically, those were the examples from the releases where there was a large amount of data on movement of the releases. So yes, that's typically the gasolines or the diesels or a refined product, yes.

Q. Now, you made the statement under questioning from Commissioner Olson that if the current rule were adequately enforced, there wouldn't be a problem. What did you mean by that?

A. I'm not sure if it wouldn't be a problem, I just believe that the current rule --

Q. I'll be honest with you, I only caught the first part of the response, so that may not have been the proper -- you can correct me on the latter -- the conclusion after the premise.

A. I guess I stated that the current rule, if

adequately enforced, was protective of the public health and the environment, and also that the other responsibilities of the Division in my opinion.

Q. Okay. But let's go to the "if adequately enforced" part. Is it not adequately enforced now?

A. That's a -- that's a good question. I believe that it's been demonstrated at the testimony that there's a large caseload of work for the employees of the Division, so it's been evident to me that some additional staffing in the Division would allow for increased enforcement, and increased opportunity for inspection.

Q. May I quote you on that?

(Laughter)

A. Yeah, I -- that's my opinion. It may not work well in the legislative arena.

Q. Commissioner Olson covered this pretty thoroughly, but I do want to talk just a minute about Exhibit 8. And I think since the mid-'60s we can see a pretty clear trend for a decrease in TDS, whether that's total dissolved solids or total dissolved salts, concentration of the river over that period of time. And then suddenly somewhere around 2003, it jumps up, it doubles. Do you have any reason for that?

A. Well, I'm trying to find the chart, but just in general statement, there seems to be a correlation on the

flow rate on all of the points, not just this particular one, in the data set, that the higher the flow rate in the river, it has a lower overall salinity. And I think that's consistent across, you know, all the data sets that I have reviewed.

Q. Okay.

A. And I'm still trying to find the exact plot. I've found it now.

Q. Okay. I have a hard time reading the -- especially the lower curve, but it looks like, you know, during a period from 1970 through 1985 when the flow rate was relatively constant, the TDS was still coming down. Is that your interpretation?

A. Yes, I believe it was getting lower. The -- Again, I'm not sure why that impact -- impact is that way.

Q. Now, going on to Exhibit 9 -- and again, being the last guy, everybody takes all my good points -- but you were pretty critical of Mr. Hansen when he used Dulce as the climatological analogy for his analysis, and yet you're asking us to accept work that was done in the Mojave Desert as a hydrologic vadose zone analogy. Could you try one more time to convince me that there's a legitimate difference there?

A. I don't think I was recommending using Nevada as an input parameter for the model in New Mexico. I believe

what I testified from Mr. Hansen's model was that there were a number of climatological data selections that were more current, I believe, and more proximal to the San Juan Basin.

His data set ended in the year 2000, where there's current data available through 2007 that's been collected at the Aztec historical ruins in Aztec, New Mexico, I believe since 1946. There's data at the Farmington regional airport and agricultural center, there's data from Lybrook, New Mexico, that has gas plant data, that has all the climatological information available that would be more representative of the San Juan Basin.

So I hope I didn't imply that we -- that I'm recommending using data in Nevada as input parameters to the model, because that wouldn't be correct.

Q. Okay. Now I may have made this point and I'm getting so senile I don't remember. But what I wanted to do was, when we found that paragraph in Exhibit 5 -- Exhibit 9, I'm sorry, on the third page, to point out that it says, Little is known about how or, or to what degree, features of the natural system may be altered by the installation of the disposal facility, and relate that to the installation of a pit.

Does that seem like a legitimate connection to you? Having said that, I remember we did talk about it.

A. Right, I cannot -- I remember referencing that point.

If you're disturbing the soil, I think the point of that paper was that the flow regime in the disturbed area would be impacted and would be different, and I would agree with that.

CHAIRMAN FESMIRE: Ms. Foster, I have no further questions. Do you have a redirect of this witness?

MS. FOSTER: Actually, Mr. Chairman, I do not.

CHAIRMAN FESMIRE: Boy, that puts an end to things, don't it? I'm assuming that you've got another witness?

MS. FOSTER: I do.

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

THE WITNESS: Thank you, sir.

MR. BROOKS: Mr. Chairman, in view of the absence of redirect, which I wasn't exactly anticipating, I must ask the Chair if we can question Mr. Mullins in recross on matters that he testified to after -- in response to the Commissioners' questions and in response to, particularly, Dr. Neeper's questions, which occurred after we concluded our last examination.

CHAIRMAN FESMIRE: Given the convoluted way that this has to be handled, I would think that would be fair,

Mr. Mullins.

Ms. Foster, are you going to object?

MS. FOSTER: I will.

CHAIRMAN FESMIRE: Okay. But I think, you know, since they have not gotten a chance to examine on subjects raised during the rest of the cross-examination, they should be given the opportunity.

MR. BROOKS: Thank you, Mr. Chairman.

MS. FOSTER: And actually, with that in mind, I was informed over lunch, or prior to lunch, that if the Division intends to call Mr. Hansen as a rebuttal witness for the modeling, I would also reserve Mr. Tom Mullins as a rebuttal witness on the modeling issue, should that be necessary.

CHAIRMAN FESMIRE: Absolutely.

MS. FOSTER: Thank you.

CHAIRMAN FESMIRE: Mr. Brooks?

MR. BROOKS: Okay. I just have a very few questions.

EXAMINATION

BY MR. BROOKS:

Q. In response to Dr. Neeper's question, he asked you about the SPLP test, and I believe you said that the SPLP test is conducted by diluting the material being sampled in 20 times the volume of pure water; is that

correct?

A. I don't believe that's correct from the way he asked the question, no.

Q. Well, then how -- then tell us what is correct.

A. I believe Dr. Neeper questioned regarding a volume dilution of the sample at 20 to 1.

Q. Well, that's what I intended the question -- that was exactly the question I intended to ask, and I'm not sure I understand the difference between what you're saying and what I said.

A. I'm not sure what your question is.

Q. Well, do you conduct the SPLP test by taking your sample and diluting it in a volume of pure water equal to 20 times the amount of sample that you have?

A. My understanding, it's a dilution ratio of 20 to 1.

Q. Okay. And did you also testify in response to Dr. Neeper's testimony that you would not expect that there would be enough water coming in through precipitation into buried waste to dilute that waste 20 to 1?

A. Based upon what I was saying with effective porosity and total porosity, that I felt that that's correct, what you're asking, yes.

Q. Okay. So on that basis, how do you justify saying that an input parameter into a model should be 1/20

of the concentration in the waste?

A. I'm utilizing, to be consistent with the Oil Conservation Division's proposal and some information presented as well by industry, a 20-to-1 dilution ratio from a solids -- for an input model into a vadose zone model.

Q. But you're not telling us that the actual concentration of salts in the water that comes out of the waste, assuming some water does percolate out of the waste -- you're not telling us that the actual concentration of salts in that water, in the leached-out -- in what is leached out of the waste is going to be 1/20 of the concentration in the waste, are you?

A. Not exactly. What I was stating was that the concentration of chlorides in the solids, taking the highest reading in northwest New Mexico and making the assumption that a 20-to-1 ratio of leachate would occur, that that waste stream at its highest would be 265 milligrams per liter.

Q. Well, listen to my question, though. You are not telling us that the wastes -- that the concentration in the leachate will be 1/20th of the concentration in the waste, whatever that is, are you?

A. No, that's the assumption based upon an SPLP method, is that it is 1/20 dilution of the solid chloride.

Q. But you're not telling us that's the concentration in the leachate that will come out of the waste?

A. I don't know what the actual concentration of leachate coming out of the waste is.

Q. Now you have already said, have you not, that -- when you said in response to Dr. Neeper's question, well, but some of the -- of the waste -- some of the salts in the waste will not be mobile? You said that in response to Dr. Neeper's --

A. Yes, I believe that's correct.

Q. But would you -- you wouldn't expect that 95 percent of them would not be mobile, would you?

A. I don't have an exact percentage figure.

Q. Okay, very good. I think that's all I have on that subject.

CHAIRMAN FESMIRE: Ms. Foster, do you have a redirect?

MR. BROOKS: Well, I'm sorry, I have one -- I have a couple of other questions.

(Laughter)

MR. BROOKS: I said that's all I have --

CHAIRMAN FESMIRE: If you keep doing this, I'm not going to believe you next time.

MR. BROOKS: -- on this subject.

Q. (By Mr. Brooks) You are proposing what you call the taco closure, correct? That's what you said in response to Commissioner Bailey's question?

A. Well, I'm not proposing that.

I basically stated for the last 15 years in northwest New Mexico there haven't been burrito closures, they've been taco closures, as on-the-ground current conditions.

Q. And you do not think the rules should be changed to prohibit that?

A. I don't understand your question.

Q. Maybe that's irrel- -- maybe it's irrelevant anyway. I'll pass on to something else.

If you have no -- In that scenario you have no cover over the closure when it's closed, right? Over the pit contents when it's closed; is that correct?

A. No, that's not correct.

Q. Well, I'm sorry, you have no liner cover over the pit? Yes, you have a soil cover, but you have no liner?

A. In the menu item of tacos versus burritos, the taco does not have a cover on top --

Q. Okay.

A. -- that's correct.

Q. So if you have precipitation coming down -- well, one other question.

You testified that you did not think that the liner would be compromised in the process of closure?

A. That's correct. I do not believe that the testimony that's been presented demonstrated in any regular occurrence, and it hasn't been my professional experience that the liner was compromised during closure.

Q. If the -- if there is no impermeable cover over the pit contents and the liner is not compromised, is moisture from precipitation not going to accumulate in the waste?

A. It can, yes.

Q. And would not that tend to increase the mobility of the contaminants in the waste, if, as and when the liner did fail?

A. It could, but not likely, given the arid environment in northwest New Mexico, and the precipitation. With the liner underneath it, the majority of the liquids would be traveling upward in evapotranspiration.

Q. Have you done any studies to figure out how much of it would gather in the waste in this particular -- in the depth range we're talking about?

A. No, sir, I have not.

Q. Thank you. One question and I'm done.

CHAIRMAN FESMIRE: I've heard that before.

Q. (By Mr. Brooks) This is in regard to Exhibit 8.

This is the San Juan flow chart?

A. Yes.

Q. And you've been questioned extensively about that?

A. Yes, I have.

Q. Now I'm not sure what the purpose of this exhibit was, but let me ask you this as far as its relevance to this proceeding.

If that exhibit did demonstrate that the concentration of salts in the San Juan is encroaching toward the standards, water quality standards, would that in your judgment indicate that the Commission should be less concerned about -- about introducing more pollutants into the San Juan, or wouldn't it suggest that the Commission should be more concerned about incremental pollution to the San Juan?

A. Well, I guess that what this exhibit is representing is that given the maximum amount of testing and a 20-to-1 dilution from the solid phase, an assumption would be that the leachate -- that if it did travel out of a reserve pit, or a temporary lined reserve pit in northwest New Mexico, would be 265 milligrams per liter in concentration of salts, which is actually below the level of the current San Juan River as measured at this point.

It was just talking about the relevance of the

salinity, that's what the exhibit was for.

MR. BROOKS: Before I asked that question I promised only one more question, so I will not ask any more. I will pass the witness.

CHAIRMAN FESMIRE: Ms. Foster, do you have a redirect on those issues?

MS. FOSTER: I do not, thank you.

CHAIRMAN FESMIRE: Okay. Does anyone have any further questions of this witness?

Mr. Mullins, thank you very much.

THE WITNESS: Thank you, sir.

CHAIRMAN FESMIRE: I know you've heard that before, but I mean it this time.

Ms. Foster, who's your next witness?

MS. FOSTER: Our next witness, Mr. Chairman, is Mr. John Byrom.

CHAIRMAN FESMIRE: Mr. Byrom, you haven't been sworn, have you?

MR. BYROM: No, sir.

CHAIRMAN FESMIRE: Why don't you come forward and raise your right hand, please?

(Thereupon, the witness was sworn.)

MS. FOSTER: The beginning section of Mr. Byrom's testimony, Mr. Chairman and Commissioners, will be on Exhibit 32. It will be a slide show.

JOHN BYROM,

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

DIRECT EXAMINATION

BY MS. FOSTER:

Q. Good afternoon, Mr. Byrom.

A. Good afternoon.

Q. For the record, could you please state your name and give us a little bit of your background, please?

A. Yes, my name is John Byrom.

I am currently the president of D.J. Simmons, Inc., a small independent producer up in Farmington, New Mexico.

I also am this year's president of the Independent Petroleum Association of New Mexico.

My background, I grew up in Farmington since I've been ten years -- since I was ten years old. I went off to college, graduated from Texas A&M with a mechanical engineering degree.

After that I went to work for Union Carbide, became an operations engineer and then an operations manager on their pipeline system along the Gulf Coast.

In 1994 I had the chance to move back home and took it and went to work for D.J. Simmons as an operations engineer, and that was in, you know, '94. And then I

progressively moved up to being operations manager, then vice president, then president over the years.

My responsibilities has been overseeing capital investment for the company, overseeing of course general management, working on individual project wells, doing acquisitions and divestitures in multi-million dollars, also managing capital spending projects of drilling and workover projects in the multi-million-dollar range.

Q. And does D.J. Simmons have any employees?

A. Yes, we do.

Q. How many do you have?

A. We have approximately 25 employees in D.J. Simmons.

Q. Okay, and is D.J. Simmons affiliated with another company that you also oversee?

A. Yes, we have a sister company that we are general manager of, or our corporation is general manager of a separate company called Twin Stars, Ltd., and that is a wellhead compression company. It's also based in the San Juan Basin.

Q. Okay. Now in terms of regulatory issues, have you ever been appointed to any regulatory task forces or stakeholder groups?

A. Oh, yeah.

(Laughter)

Q. Let's start back in time, go back a couple of years.

A. Yeah.

Q. Have you ever been -- What task forces have you been appointed to?

A. Well, this -- the particular pit rule that we're talking was actually reviewed here, I think it was in 2002 when the hearings occurred, I believe, or maybe 2003, and I was on the task force leading up to those hearings. Also I observed those hearings, I didn't -- I was not a witness in those hearings. And so that was that.

And then I was, of course, a task force member of this recent task that was set up by the Governor this spring, and participated in that through its entirety.

Q. And were you also a member of the surface waste management task force?

A. Yes, I was, I forgot about that task force. Yes, I was, I was a member of that task force. I think that was the latter part of last year and maybe went into a little part of this year. I don't remember exactly.

Q. Okay, all right. Now we'll go into the task force issues a little bit later in your testimony, but let's start off your testimony with Exhibit 32, which is your slide presentation. Did you actually prepare that?

A. Yes, I did.

Q. And are you familiar with that?

A. Yes, I am.

MS. FOSTER: Okay. Actually, Mr. Chairman, prior to having Mr. Byrom speak about his slide show, I would actually move him in as an expert professional engineer.

CHAIRMAN FESMIRE: All right. Mr. Byrom, are you a licensed professional engineer?

THE WITNESS: No, I am not a licensed professional engineer.

(Laughter)

CHAIRMAN FESMIRE: It will be difficult to admit him as an expert professional engineer. You mean an expert in oil and gas production operations?

MS. FOSTER: That would probably be more fair.

CHAIRMAN FESMIRE: Would that be satisfactory, Mr. Byrom?

THE WITNESS: Yes, sir, I would feel confident about that.

CHAIRMAN FESMIRE: Any objection?

MR. BROOKS: No objection, your Honor.

CHAIRMAN FESMIRE: Mr. Byrom is so admitted.

Continue, Ms. Foster.

Q. (By Ms. Foster) Okay, looking at Exhibit Number 32, this is a document that was prepared by you?

A. Yes, it was.

Q. For purposes of this hearing?

A. Yes, it was.

Q. Okay, if you could please, using the narrative form -- if that is okay with the Commission --

CHAIRMAN FESMIRE: It is.

Q. (By Ms. Foster) -- and move through the slides.

A. Okay. "Affect [*sic*] of Proposed Rule 50" is an error. I think the new rule is 17, but the old rule is 50. Apologize for that.

Stepping through my slides, I guess before I get started, the reason that I did -- went through this exercise is, I wanted to come up with an estimate of the effect -- the potential effect of the drilling activity and economic activity on the oil and gas industry if this rule was put into place as written.

And so what I did is, I tried to determine what kind of wells, in my mind, would be affected by this jump in drilling costs resulting from the need to do closed-loop or the dig-and-haul of the pits.

So the best way that I figured that I could do that is not really -- I don't have the capacity to go and evaluate existing reservoirs and determine their economic productivity on an area-by-area basis, but the better way to do it, more efficient way to do it, would be to look basically over our shoulder at recent wells that were

drilled and determine which ones of those wells would be, in my mind, marginal wells, based on the production that they actually got.

And then from that, then deduct that those wells would be the ones that would be affected, thinking that wells that are not marginal, that are clearly giving a good return well in excess of any targets would not be affected, but the ones that are down closer to the marginal point would be -- could be affected by the increased costs.

Q. Mr. Byrom, where was -- before we move on, where was it that you found your increased cost numbers?

A. The increased cost numbers I used was -- were from the data submitted by Sam Small's -- the IPANM expert witness on --

Q. Okay. And why did you pick the closed-loop numbers?

A. I actually went with closed-loop numbers. They're somewhat higher than the dig-and-haul numbers. My -- the main reason I went with that is, I feel that the ability to use the pits is very limited, there's going to be some cases where we can use pits, but based on the restrictions that we have, that are proposed in the current rule, I don't think that there's going to be a lot of pits out there.

And the other thing, I was looking at the

economics. There would be less amounts, according to Sam Small, but at the same time, then, you're assuming that you'll be able to clear the pit, any samples that you would take wouldn't show any kind of spill, and so that you may have additional risks and different -- additional costs there.

So that's why I chose the closed-loop cost as incremental cost.

Q. Okay, thank you. You may proceed, please.

A. Okay, so the first graph, what I did is, I analyzed 2004 wells, and this was data that I got off of *IHS Data* that the company pays for, but they get their data from New Mexico state production. And I looked at the various major types of production in the San Juan Basin.

I did not look at the southeast part of the state. I'm not familiar with those wells down there from the standpoint of their -- of economics.

So what I did is, I looked at the major producing formations in the San Juan Basin.

And in 2004 there was, according to my data, 285 wells that were completed in this formation. That doesn't mean there was 285 wells drilled just to the Mesaverde, because there's a number of times that we have producing wells that are completed in multiple formations.

But in this case you can see the initial

production of the well.

The red line is the gas, the blue line is the water production, and the green line is the -- the green line is the oil production.

And this is typical of a tight-sands well in the San Juan Basin. The actual ramp up there at the beginning is because -- it's a compilation of a number of wells over a couple of months, so that ramp-up is just when all the wells came on. So I used my starting point just a little bit higher than that. But that's the average production of all those wells.

And you can see this is a logarithmic graph which tends to -- a straight line would indicate normal logarithmic decay, as you see in all kinds of places in nature. But you'll notice on the left it's actually a curve that drops faster than a straight line, and that's because of the near-wellbore faster depletion that we see in our tight sands, and then it goes on to the more normal decline rate after a couple of years.

CHAIRMAN FESMIRE: Ms. Foster, may I ask your witness a couple of questions about this?

THE WITNESS: Yes.

MS. FOSTER: Sure.

CHAIRMAN FESMIRE: Now that is per well monthly average?

THE WITNESS: That's the average.

CHAIRMAN FESMIRE: Okay. And these things apparently water out at a pretty high gas rate; is that --

THE WITNESS: Excuse me?

CHAIRMAN FESMIRE: These things apparently water out at a pretty high gas rate after 30 years; is that what you're telling us?

THE WITNESS: No, I'm sorry, that's months of production, that's 30 months.

CHAIRMAN FESMIRE: Thirty months --

THE WITNESS: And this is only 2004 data. I'm glad you asked that question. And the reason I picked 2004 is because the data is old enough that I could actually get -- it's current data, as current as I could get, and yet still have enough production time to be able to get a decline rate on it. So that's why I picked 2004 data.

CHAIRMAN FESMIRE: So it's 30 months starting in January 1st, or the middle of --

THE WITNESS: Yeah, and --

CHAIRMAN FESMIRE: -- 2004?

THE WITNESS: Basically, yes, sir.

CHAIRMAN FESMIRE: Okay, so it's not some dimensionless time, it is a specific date average for those 285 wells?

THE WITNESS: That's right.

CHAIRMAN FESMIRE: Okay.

THE WITNESS: That's right.

Q. (By Ms. Foster) But actually, Mr. Byrom, before we move off of this slide, the blue line is your average of water?

A. Average water production.

Q. Right, and it looks like you do have a spike or an increase in the average water production around the 22-month period?

A. Right. And you know, this is an average of a lot of different wells. I can't explain that spike. Normally that's not a -- that's not something that I would necessarily expect to see in typical Mesaverde wells, but there's a number of things that could occur where you -- I know that our Mesaverde wells will increase in production and water production periodically due to things that we're not exactly sure about, but we think there's waters that move through the reservoir. That Mesaverde is a very contiguous reservoir, and waters can move through there, so -- But I'd just be guessing as to why that --

Q. And your green line --

A. -- would be increasing.

Q. -- is your average of liquid. What is --

A. Excuse me?

Q. Your green line is average of liquid. What --

A. Okay, that's the average of liquid. That's hydrocarbon liquid, so that means basically oils or condensate.

CHAIRMAN FESMIRE: Could you give us an idea what the units are on your oil?

THE WITNESS: Yes, on the left it says monthly production, MCF, but it's also monthly production, barrels. Sorry about that.

CHAIRMAN FESMIRE: Barrels per month.

THE WITNESS: Barrels per month.

CHAIRMAN FESMIRE: Okay.

THE WITNESS: So a Mesaverde well, you can see, even starting out doesn't make a whole lot of oil, and then it declines pretty quickly. It's just a characteristic of the Mesaverde wells in the San Juan Basin.

Q. (By Ms. Foster) Thank you.

A. Any other questions on that curve?

Then moving into the -- I did a similar exercise with the Dakota completions. Once again, we see the same kind of tight sands character with the -- I guess a hyperbolic decline initially, and then more lining out to a straight-line logarithmic decline going on after that.

The next graph is the Pictured Cliffs formation. Once again, a very similar decline, hyperbolic initially, lining out. You'll notice the Pictured Cliff initial rate

is quite a bit lower than the switching back to the Dakota and the Mesaverde, the Pictured Cliff initial rate is quite a bit lower. That formation is not nearly as productive.

And then the last one is a Fruitland Coal well. This is different in that rather than tight sands this is actually produced coalbed methane, and so you'll notice that the initial production actually is inclining at the beginning and then beginning to drop off at a slower rate.

So the character of this well is different, and it's important to note as I speak about the future graphs that I'm going to go into.

Now with the Commission's permission I want to skip ahead through these graphs. I think -- I apologize for jumping through them, but I'd like to skip on down -- well, maybe I don't want to skip. I'm sorry, don't try to keep up with me.

I guess I should go ahead and go through this, I apologize.

This graph here -- so this is the page 6 of my exhibit -- what I did in the -- of course, I worked through tremendous amounts -- volumes of data. And one of the parameters that's readily available in the data set is the first year's production of a well.

So not just the initial production, which would be reported in a typical completion report, which could be

high or low depending on when the operator decided to take the actual reading. This is what the well produced in the first year.

So this is -- if you'll look on the axis label it says first 12 months of production in MCF. So this is what the wells were producing -- it's the average production of the first wells -- excuse me, the first 12 months' average production of wells drilled for that year. And my data went back to 1970.

CHAIRMAN FESMIRE: So Mr. Byrom, we're looking at reservoir depletion until about '92 --

THE WITNESS: Yes.

CHAIRMAN FESMIRE: -- and then we're looking at some sort of frac technology?

THE WITNESS: Yeah, I think it was -- it may be some frac technology. I think it had a lot to do with -- we had a lot of wellhead compression going on. We also had infill drilling going on at that point, so some of the wells were able to go in and tap untapped reserves so that the -- they were less depleted areas where they were doing so.

A combination of that is why we saw the spike, and then the continued downward trend going on, as one would expect as the mature -- as the reservoir matures.

The next graph talks about the Mesaverde

formation. This has also a similar downward decline, infill drilling happening in the 1980s and '90s, bringing that back up and more of a subtle decline in the first 12 months' production on that one.

The next graph is the Pictured Cliffs formation, once again showing a spike in the '90s. It's going to be more sensitive to things like lowering pipeline pressures, either through global compression projects or through wellhead compression, because the reservoir pressures are typically shallower because -- I mean, less because they're shallower. It's a shallower formation, typically, around 3000 feet or 3500.

And then the last graph shows the first 12 months' production average of the Fruitland Coal wells. You can see that the big boom in drilling occurred when the federal government allowed the tax credit drilling, and so that's, I think, the graphs to the left, the data points to the left.

My guess is, I don't think there was a whole lot of coal well drilling, coalbed methane drilling during that time. But then as you get into the late 1980s, that's when the real effort was expended drilling those wells. And that, once again, is showing another -- similar kind of decline.

So that -- the purpose of these slides is just to

show that generally over time, you probably have some spikes through different technologies or infill drilling, wellhead compression. Generally the wells -- the initial production of the wells is dropping as one would expect in a maturing gas field.

The next graph shows the first year -- first 12 months' production, or first year's production, of all the wells that were actually drilled in 2004.

And what I did here is, I actually went in and analyzed the data and got only the well that was drilled. So you can see according to my data there was about 700 and some wells drilled in the San Juan Basin of New Mexico that year. And so this is combined production. If a well did have multiple completions, then this would be the combined production from those multiple formations.

So one can see that, you know, the first 100 wells on this graph were -- had initial production rates of, you know, probably down in the 20 -- first year's production of maybe 20,000 MCF. As you get up towards the right, it starts going through the 200,000, 400,000, and on up.

And what this graph illustrates is that, of course, the bulk of the production -- or the bulk of the wells that were drilled were less than, for instance, the 200 line. And then a fairly -- relatively small, maybe a

quarter of them were above that line.

And of course as you go very far, it goes asymptotically up on the right side of the curve, indicating that we had a few very -- very, very good wells, but they are relatively few in number, compared to the total number of wells drilled.

Q. (By Ms. Foster) Mr. Byrom, before you move on could you, just so the record is clear, give us an estimate of approximately where the 200,000 mark crosses over your line?

A. That would be at about 550 of the 770, 780 wells drilled, fell below the 200 line, for instance.

Q. Thank you.

A. Okay, this shows first year's production by formation. Now these are wells -- these are Dakota wells that were only Dakota wells. These are not wells that were commingled with anything else. And according to my data, there were 17 of those wells drilled in 2004.

And then what I did -- as you can see, this has a similar kind of ramp-up to the right as the -- in character to the previous graph.

These 17 wells, the -- for instance, the -- these wells are not -- 1 through 17 does not imply the date they were drilled or the order in which they were drilled. It's simply putting the smallest first year's production on the

left and the greatest first year's production on the right, a parado chart, what I would call.

So these wells show that, once again, a large number of these wells fell underneath the 100,000 range, and then a smaller number of them actually exceeded that.

And the reason that is important, I -- based on those -- the type curves that I developed on the respective formations and then fitting that to the first year's production, I was able to determine or estimate the economic viability of those wells and what kind of a first year's production I would have to have in order to meet my economic threshold.

So the blue line shows that line based on my estimate for a typical Dakota well drilled in San Juan Basin, what kind of reserves you would have to get in order to make that well economic.

And what this indicates is that at least a large number of wells -- and this is something that is important to understand. This is what -- this is the production after the well was drilled. And obviously, the operator made an assessment or a guesstimate of what that well would produce when they went out to drill it.

So what -- all we can do, as I said, looking over our shoulder, is look at what the well really did do. And it's reasonable to assume that the wells 1, 2, 3 and 4 were

probably pretty good disappointments for the operator. At the same time, there may have been -- 14, 15 or 16 could have also been marginal wells, but turned out to be pleasant surprises for the operator.

So based on that, the probability that any kind of estimate -- some are going to be lower, some are going to be higher than what actually turned out. I'm just using that blue line to indicate the area in which I would say that the typical wells in that particular formation were economically borderline when the operator made the decision to drill that well.

The dashed line shows the incremental increase in volume that one would need to get in order to be -- for that same well to be economic if you were to add the closed-loop drilling costs on to that.

So once again, on this graph it doesn't look like a big amount, but nonetheless that does show that, from this graph, a good portion of the wells, the Dakota wells drilled in 2004, were marginal economic wells. And so when the operator looks at those wells to drill, whether or not to drill them or not, an increase of 10 to 15 percent increased drilling costs is going to be a significant factor in their decision to drill.

Now I would say the wells that were in -- off t the right, would not have had a problem meeting the

threshold.

The next graph shows a similar graph for the Mesaverde. There was a lot more just straight-up Mesaverde wells drilled. The break-even point before the -- what I'm considering the economic break-even point for the Mesaverde well, given my economics, was five -- excuse me, comes in at around, just looking at the graph 700,000 MCF for the first year --

CHAIRMAN FESMIRE: 70,000.

THE WITNESS: Excuse me, 70,000. Thank you. Thank you, Mr. Chairman.

That jumps up to closer to 80, 85, with the closed-loop drilling costs coming in.

So once again in this graph, just looking at the cutoff, it's easy to see that about the lower third of the wells in the Mesaverde formation would have been considered marginal by that case.

MS. FOSTER: I apologize to the Commission. I just realized that my exhibit went from page 11 to page 14.

CHAIRMAN FESMIRE: So does mine.

MS. FOSTER: Yeah, this slide is not included as what I was probably going to -- 12 and 13 are missing, and I can get the Commission copies of that during break, if you'd like.

CHAIRMAN FESMIRE: Mr. Brooks, do you need it

to -- Why don't we see how the -- go ahead and look at them and see how --

MR. BROOKS: I don't think I need it immediately. I would like to be furnished with it eventually.

CHAIRMAN FESMIRE: Okay. Why don't you do that at the break, Ms. Foster?

MS. FOSTER: I apologize

THE WITNESS: Okay, the next graph is a similar graph of the Pictured Cliff formations. Once again, there was only 11 wells drilled that year in this formation, and that is a case where the -- you can see that the first-year's production doesn't have to be nearly as high. We're looking at somewhere around $32,000, because the drilling cost of a Pictured Cliffs well is significantly less, because it's a shallower well.

But nonetheless, I think this graph clearly shows that a large portion of the Pictured Cliff wells are marginally economic wells drilled in the San Juan Basin.

This graph shows the -- what happens when you're able to actually commingle multiple formations, and this is a very common occurrence in the San Juan Basin, in certain areas of the Basin where we have the Dakota-Mesaverde commingle.

And you can see that my economic threshold has moved up now over $100,000 because these wells are more

expensive to drill. They're multiple formations, multiple completions. But then -- so less of these type of wells would be affected, what I would consider to be affected, based on my threshold for a marginal well. So it would be more down in the 15 to 20 percent.

Q. (By Ms. Foster) Before you move from this slide, just so again the record is clear, your blue line cuts off your wells as marginal at what number, approximately?

A. At a hundred -- It's a little bit hard to tell on this graph, but it's a little over $100,000. And the added cost of the closed-loop drilling would add it up to -- take it up to probably something in the $120,000 range.

Q. Okay, which would mean that your well needs to make the $120,000 range in order not to be considered marginal?

A. Well, what it means is that at least according to my economic threshold, that first year would need to make that kind of production in order to beat that economic threshold.

So any wells that are in that area to the left are going to be threatened to not be drilled, based on the fact that those are economic -- or those are marginal wells.

Q. Okay, thank you.

A. This graph is a great one for those of you who

can't read very well.

(Laughter)

I apologize for that. So this is all my background data, and if you can read it, you can ask me questions.

I'm going to go ahead and go through this. I apologize for it being so small. It was bigger on my computer screen.

But these base costs are what I use from actual AFEs that we've received as working interest owners in other wells or wells that we've drilled ourselves. So the Dakota if $950,000, a Dakota Mesaverde would be $1.45 million, straight Mesaverde would be approximately $900,000, and a Pictured Cliff well would be about $350,000.

So the economic threshold for those wells, based on the first 12 months' production, is $73,474.

Ms. Foster, do you want me to read these numbers one by one --

Q. No.

A. -- or is that necessary?

Q. No.

A. Okay.

Q. I would hope that this will be put into evidence --

A. Okay.

Q. -- as an exhibit, so --

A. The -- Just to note, the Dakota-Mesaverde threshold is $105,000. And dropping down, the Mesaverde is lower, and then the Pictured Cliff is quite a bit lower.

That's first year of production.

Now -- then basically curve-fitting those decline curves to that first year's production, I was able to come up with the ultimate reserves. And so you can see that's -- for the Dakota it would be 440,000 MCF, or .44 BCF, billion cubic feet, for the Dakota. The Dakota-Mesaverde dual is higher, the Mesaverde drops down similar to the Dakota, and then the Pictured Cliff is lower.

And then just for a reference, a threshold IP for the first month, I just put that on there for a reference.

The next column shows additional costs due to the new rule. What I did is, I took the costs, incremental costs according to Mr. Small's data, and I subtracted that out and put that in.

You'll notice that I used -- Mesaverde was $127,000. I extrapolated that, because a Mesaverde well is usually not as deep as a Dakota well.

And then also the Pictured Cliffs wells are normally -- that's less than the $4000-foot incremental cost that Mr. Small's data show, because typically Pictured

Cliff wells are shallower than 4000 feet. Usually they're more in the 3300 feet.

So that increased cost.

I had new costs, which of course added the drilling cost, which then correspondingly bumped up the kind of production that I'm going to have to get from those wells, and so...

The other columns, the remaining columns, the first 12 months' threshold is the corresponding increase in first 12 months' threshold, which also corresponds to the estimated reserves for that well.

So you can see, for instance, that the Dakota well jumps from meeting reserves of .44 BCF up to over half a billion, and all the others have a similar jump.

Q. Actually, for the record, if you could just please read those increases in percentages?

A. Okay, the increase in percentages that would be necessary in order to bring -- to meet the economic threshold, given those extra costs, would be -- for the Dakota would be 16 percent.

For the Dakota-Mesaverde dual -- excuse me, commingle well would be 13 percent.

The Mesaverde would be 13 percent.

And for the Pictured Cliffs it would be -- I had 17 percent for the first 12 months and 22 percent for the

total reserves.

Q. Okay. And Mr. Byrom, did you de-rate Sam Small's $150,000 closed-loop costs for each of these types of wells?

A. Yes, I did, I -- the incremental costs, once again, were based on the depth drilled of the well. So I did adjust for that.

Q. Okay, thank you.

A. Okay, the next graph shows the -- This is just a histogram which I think makes -- is pretty much -- the point was made before that --

MS. FOSTER: Commissioner Fesmire, there were additional slides that were submitted by Mr. Byrom, I believe on the date in question, but they were not included in my exhibits, and I apologize for that. I can get the Commission copies, but I would -- In terms of foundational requirements, I'll ask him if he did create these slides and these were part of his exhibits.

I do believe they were sent to the Commission in proper format, they just were not included by me in the proper format.

CHAIRMAN FESMIRE: Okay. I didn't get them, but --

MS. FOSTER: Okay. Well, if you -- what we could do, then, would be move slides 1 through 15 in as exhibit

-- part of Exhibit 32, which was included, other than those other two slides, by IPANM. We'd ask to move those into evidence, since they were reviewed.

And then these additional slides would be just as a demonstrative aid to know we can have the continued discussion.

CHAIRMAN FESMIRE: Well, I think if he lays the foundation there's no problem getting -- and if Mr. Brooks and any of the other attorneys doesn't object, there wouldn't be any problem getting them in. I'd just like to have a --

MS. FOSTER: A copy --

CHAIRMAN FESMIRE: -- a foundation laid and a copy.

MS. FOSTER: That's right, that's right. And I do intend to lay a foundation, I just want to acknowledge to you that it is my oversight that these additional slides did not get included, so there would be, I guess, an exhibit that would be offered after the fact, would be the best way to put it. And if you'd like me to --

CHAIRMAN FESMIRE: Mr. Brooks?

MR. BROOKS: Mr. Chairman, we have no objection as long as we're furnished with copies.

CHAIRMAN FESMIRE: Okay.

THE WITNESS: Ms. Foster, I do have -- I think I

have enough copies of some of these slides. I just printed some out. Based on previous things that have happened in the --

MS. FOSTER: Okay, I'll --

THE WITNESS: -- hearing that --

MS. FOSTER: -- make additional copies over break and --

THE WITNESS: Okay.

MS. FOSTER: -- and I'll distribute them.

CHAIRMAN FESMIRE: Okay, is there any more besides 16?

THE WITNESS: No, there's a few more here. And I have them in my briefcase. I could get them and distribute them if you would like me to, if you want to follow along with paper as opposed to looking at the screen, whatever the Commission would prefer.

CHAIRMAN FESMIRE: Given weak old eyes, I'd kind of like to have one in front of me.

THE WITNESS: Okay --

CHAIRMAN FESMIRE: Why don't you go ahead and do that?

THE WITNESS: Permission to --

MS. FOSTER: Could we ask for maybe a five-minute break at this time, and then I'll make copies --

CHAIRMAN FESMIRE: Okay.

MS. FOSTER: -- for everyone?

CHAIRMAN FESMIRE: Why don't we make it a 10-minute break and start --

THE WITNESS: I think I've got enough copies.

MS. FOSTER: Do you?

THE WITNESS: I think.

CHAIRMAN FESMIRE: Why don't we go ahead and take a 10-minute break, and you all can figure it out?

MS. FOSTER: Thank you.

CHAIRMAN FESMIRE: We'll reconvene at 3:30.

(Thereupon, a recess was taken at 3:20 p.m.)

(The following proceedings had at 3:35 p.m.)

CHAIRMAN FESMIRE: Okay, let's go back on the record. This is Case Number 14,015, the continuation of Case Number 14,015. All three Commissioners are present.

We were in the direct examination of Mr. John Byrom.

Are you ready to proceed, Ms. Foster?

MS. FOSTER: I am, Mr. Commissioner, thank you.

During the break I actually did copy slides 12 and 13 and three-hole-punched them so you can put them in your notebooks.

Slide 16, we've also made a copy, and that's -- the last -- one, two, three pages are not numbered.

Slide 17 will be the one that is entitled

Burlington Resources.

Slide 18 will be the one that's entitled Energen.

Slide 19 will be XTO.

And slide 20 will be Dugan, and that will be the end of the slide presentation.

And you have copies of all that at this time. Thank you for your indulgence.

Q. (By Ms. Foster) Okay, Mr. Byrom, I believe that we were on slide 16 -- or 17, sorry.

A. Yes.

MS. FOSTER: Okay, actually on my submission this is titled number 16, okay? Just to make sure that we're on the same page.

Mr. Commissioner, may I start questioning the witness?

CHAIRMAN FESMIRE: You may.

Q. (By Ms. Foster) Okay, thank you.

Mr. Byrom, could you please explain what this slide entitled Histogram - 1st Year Production informs us?

A. Yes, Ms. Foster. Once again, the left axis or the Y axis on this graph is titled frequency, and out of the 780-some wells that were drilled in 2004 this starts with the most frequent wells on the left, going down to the least frequent in the respective bin size.

And the bin is -- the respective bins of those

different columns has to do with what the -- what interval the first year's production fell in or fell under.

So as you can see, once again, a large number of the wells had less than -- well, 38,000 or less than 40,000 MCF the first year, then the second -- or for the first year.

Then the second bin, there was another 77,000 of the wells were at that point or lower -- Excuse me, not 77,000 --

CHAIRMAN FESMIRE: 65 of the wells were --

THE WITNESS: Yes --

CHAIRMAN FESMIRE: Okay.

THE WITNESS: -- thank you. And so the next one was -- had the first year's production of 77,000, which there was about 130 of those wells and so on.

Once again, this just demonstrates the relative distribution that the lower producing wells are greater in number than the higher producing wells in this Basin.

The next graph, I went and looked at operators because I think this is significant, especially representing the Independent Petroleum Association of New Mexico.

Burlington Resources, back in 2004, who has now been acquired by ConocoPhillips, had this distribution of wells.

Once again, I put a blue -- I put the blue line in, not to say that that's the economic threshold but just for a reference, because this is all of the wells that they drilled. And one point that I'll make with Burlington is, they drilled quite a few coal wells. And because of the inclining nature of the coal wells, they -- I calculated the typical coal well, and that's a big statement, but -- in that -- there's -- the wells have a large distribution of production.

But based on my estimate, a typical coal well would come in at more like a 50,000 per first year production economic threshold. So that would be higher than that. As we saw, some of the other commingled, more expensive wells, would need initial production above that 100,000 line.

So I'm not saying that all the wells below the 100,000 are uneconomic. It's just a reference point for the Commission to be able to see.

But I am saying that in that range, that is where the wells become uneconomic.

This graph shows Burlington Resources specifically, the wells that they drilled. And you can see that the vast majority of their wells are far beyond the 100,000 threshold. So in most cases their wells are still in the more prime acreage positions in the San Juan Basin

and are thus much more profitable than some of the other operators that I'll refer to.

This is a graph distribution of Energen. And Energen is a fairly large independent company that is drilling in the San Juan Basin. They actually acquired their acreage a number of years ago from a package of acreage that was spun off by Burlington Resources, and Burlington Resources spun those off presumably because that was acreage that was not prime or core to their acreage position, and they felt they could monetize that value better by just selling it to someone else, rather than spending their resources to drill it.

So you can see that these wells do not have the distribution in first year's production that the Burlington Resources wells did, which shows once again that this is less than prime acreage. And yet they still drilled 50 wells in that year, so it does show that they -- a number of these wells I would categorize as being marginally economic and would be very susceptible to a significant increase in drilling costs, and then they would just not be drilled, a large part of these.

The next graph is XTO. XTO is an operator similar to Energen in that they entered the Basin through the acquisition of a large spinoff acreage block from then Amoco, now Bur- -- or now --

CHAIRMAN FESMIRE: -- BP.

THE WITNESS: -- BP, thank you.

So once again, this shows -- demonstrates again that there's a large portion of the graphs of the wells that could be -- would be more in the marginal category that I would put them in, and if an operator were to be looking at the decision to drill those wells or not, would be susceptible to a kind of increase of the -- the 10- to 15-percent increase that we're talking about.

Dugan is another large operator who has been there for many, many years, and once again this just demonstrates that his initial production -- these wells are -- they pretty much specialize and are known for being able to drill wells cheaper -- well, I don't know if they drill them cheaper, but they are more aggressive at going after the less key or prime acreage in the San Juan Basin.

As Mr. Mullins mentioned, you pretty much -- different operators have different acreage positions based on pretty much when they bought into the Basin and the amount of money that they invested up front.

Q. (By Ms. Foster) Okay. Now, based on all the data that you just showed us concerning the rates of production, the declines in production and the marginal producers, or the number of wells that end up being marginal, what is your recommendation to the OCC concerning

the current rule?

A. Well, obviously the OCC does need to be considered -- concerned with, or consider the protection of groundwater, I agree with that.

I think that -- I was on the task force, and there were a number of things that the industry committee -- or excuse me, not the industry committee -- the task force agreed to.

But I think the suggestion by the proposed rule to go to this dig-and-haul or closed-loop is well and above what I would think would be necessary and prudent at this time. And given the fact that the potential economic impact that this could have on the drilling in the state, as I refer to here in the San Juan Basin and other -- as has -- other witnesses have testified about the southeast part of the state, I think that it is -- it can definitely have a major effect on the drilling activity of operators in the state.

And given the fact that I think that we do have measures that the industry representatives agree to and the task force, that I think provide sufficient protection for groundwater and then going forward allow further study, collaborative study being done, going forward, to further assess the situation, that just to implement the rule as-is, I think, would be extreme and could be potentially very

costly --

MS. FOSTER: Okay --

THE WITNESS: -- for the activity in the state.

MS. FOSTER: Mr. Chairman, I would at this time request that Exhibit 32 plus the additional slides be moved into evidence, and then we'll move on to some other points of discussion.

CHAIRMAN FESMIRE: Okay, Exhibit 32 as modified at hearing, including pages 1 through 20 --

MS. FOSTER: Yes. The numbering is off a little on the slide presentation.

CHAIRMAN FESMIRE: Mr. Brooks, do you have any objection?

MR. BROOKS: No objection, Mr. Chairman.

CHAIRMAN FESMIRE: Mr. Jantz?

MR. JANTZ: No objection, Mr. Chairman.

CHAIRMAN FESMIRE: Mr. Huffaker?

MR. HUFFAKER: No objection.

MR. CARR: No objection.

CHAIRMAN FESMIRE: Mr. Carr?

Seeing no objection, Exhibit 32 will be admitted into the hearing record.

MS. FOSTER: Thank you. May I continue questioning the witness?

CHAIRMAN FESMIRE: You may, ma'am.

MS. FOSTER: Thank you.

Q. (By Ms. Foster) Mr. Byrom, you stated that you were a member of the 2007 pit rule task force appointed by the Governor, correct?

A. Yes, I was.

Q. Okay. Now specifically directing your attention to the conversations that you had on the task force concerning the below-grade tank issue, could you please relate to the Commission the conversations related to that topic? And you might want to start with your conversations on the 2003 task force.

A. Yes, I think that's relevant. This has been an issue that's been a topic of discussion for a number of years, even, as Ms. Foster mentioned, in the task force of the previous revision to the task rule -- or the pit rule.

And industry -- or not industry, it was decided in 2003 that those -- all of those pits that were -- that we would have no unlined drilling pits, which actually, in the vulnerable area, had already taken place. But there had been a number of pits that were basically partially buried.

And I'm going to use that term for clarification. These pits were partially buried because a lot of them were put in the old depression from the old pit, possibly, or a new depression was dug, just, once again, because the

gravity flow from the separator into the produced water pit is important, so the pit can't sit on the surface of the facility or the surface of the well site, because you lose that ability to dravity-grain -- drain, into the pit.

So --

CHAIRMAN FESMIRE: Dravity-grain?

THE WITNESS: Did I say gravity-drain?

CHAIRMAN FESMIRE: No, you said dravity-grain --

THE WITNESS: -- dravity-grain.

(Laughter)

THE WITNESS: I'm not an expert in dravity-graining.

(Laughter)

MR. BROOKS: Point of clarification, Mr. Chairman. Is the witness talking about pits or tanks?

THE WITNESS: Did I say pits?

MR. BROOKS: I understood you to say a pit buried within the pit, and I'm not --

THE WITNESS: Okay, well --

MR. BROOKS: -- sure just what --

CHAIRMAN FESMIRE: -- that were dravity grained.

(Laughter)

THE WITNESS: I apologize for my peculiar vernacular, so -- When I'm talking, I'm talking about fiberglass tanks or steel tanks were put in there. Thank

you, Mr. Brooks.

Q. (By Ms. Foster) Those would be your produced water tanks?

A. Those were the produced water tanks.

Q. Tanks.

A. So they were buried, partially buried, and there was a concern about those having a leak and that you wouldn't be able to detect that there was a leak.

Q. And to be clear, this is -- the discussions that you had is the 2003 task force --

A. That's correct, that's correct. So it was decided with the new pit rule that those would have to be changed over time, that they would either have to be dug up and removed or they would have to be dug up and put -- had secondary containment put in them, or put them in secondary containment, for the purposes of leak detection.

Q. Now for purposes of that task force, what was the discussion concerning what is secondary containment? What was the intention there?

A. The secondary containment was to have an area that would capture any leaks -- leaked fluids from the produced water, into that secondary containment area, making it available for detection so that you wouldn't have a multi-year leak going on.

Q. Okay. Is that what we commonly call the cellar

or a vault?

A. No. No, in this case, this was specifically -- a secondary containment was -- that was discussed for a partially buried tank that they called a below-grade tank, as was defined -- as a below-grade tank in the previous -- in the current -- in the current rule, has to do with a pit that is still partially buried, but there is a secondary containment, usually a liner of some sort, that allows the capture of any leaked fluids and the detection of those leaked fluids.

Q. Okay.

A. So as a result, because of the problematic nature of this, industry reacted by instead and digging a trench -- I mean, digging a -- what I would call a cellar, and then putting shoring walls in that cellar, either using a larger tank that -- with the bottom cut out, or actually say wood shoring or other ways to make what I would call a cellar. And then they actually put a steel tank down into that cellar. And then with the gravity, then it drained.

And there was a lot of discussion, I will say, in the previous task force relating to the -- as long as you can see the sides, then you would be able to detect a leak, just relating that to the similar case of any above-grade tank that was not partially buried.

And so industry, rather than deciding to go and

put the secondary liner, plastic liner, around it and then re-burying the tanks, actually decided to build a big cellar that kept the walls of the hole well away from the sides of the buried tank and basically making it above-grade tank.

So that was the reaction, that was the decision on industry -- on industry's part.

Now recent task force, that topic once again came up, and there was description -- discussion of what had happened in the previous task force. And of course when you start talking about below-grade tank, I think that there was and still is, based on testimony that we've already had, confusion between these below-grade tanks.

The way the old rule defined it was a partially buried tank.

Under the current definition, now it's any tank that is below grade, which is a significant change of the definition.

Q. Okay, to make it --

A. Yes.

Q. -- make the record clear, the tank below surrounding elevation is the proposed definition --

A. That's correct.

Q. -- of a below-grade tank?

A. In the proposed, I'm -- I'm -- Thank you for the

clarification. So when I say now, I mean the proposed rule has a definition that that's any tank below grade.

And there was even some discussion that even if you had a large tank battery that happened to sit a foot below the grade of the well pad, then that could even be considered below-grade tank and subject to this rule, which to me is very disconcerting. I think that is extending the intent of at least what I understood the task force to be, to continue along with the discussion of this recent task force in 2007, it was eventually agreed that on the tanks that were set in the cellars, that you could still see the sides, that there would be a potential possibility that you could have a leak in the bottom of the tank, and that leak may not be bad enough to moisten the soil enough that it would be detected from the base of the sides of the tank, where it would be visible.

So generally the task force agreed that in those cases we would put what I'm calling a deflection liner, which would be a piece of plastic, underneath the tank. Not necess- -- not wrapped around, not trying to catch the leak, but deflect a leak out to the sides of the tank where it could be visually detected by an operator.

And in my mind that was something to be done as we moved forward, and that's what I would recommend to the Commission, is talking about any new pits -- any new

cellared tanks would need to have that deflection liner, and any cases similar to what we did in the previous pit rule, any time that you were to go in and make them -- a repair or major modification on that pit or that tank that is in the cellar, you would also need to retrofit it, to put it into -- to put that deflection liner under it so that you can detect it.

Q. Now were there any discussions concerning other below-grade or partially buried tanks in the task force, as opposed -- as contrasted to the tank that is in this cellar?

A. Yes, and there was discussion about the tanks that are partially buried, and we ere going to make sure -- we wanted to -- there was even some discussion as to whether all the operators have gone through at this point and have retrofitted some of those partially buried tanks with the second liner, based on the timing of the implementation requirements of the previous rule.

And so I think once again it was agreed that we would make that a requirement of any tank that is partially buried, would have to have the secondary containment system.

Q. Okay. Now as a member of the task force, were there not drafts sent between task force members that you had the opportunity to review and comment on?

A. Yes, there were -- and I was just looking back through my notes. There was a number of drafts that were sent around different -- what am I saying? -- verbiage. The last one that we all agreed to on consensus had the language that Mr. Jones went through as green language, as consensus language from the task force.

And I think that the way that I interpreted that -- and if that's my misunderstanding, it's my misunderstanding -- is, I viewed those as two different situations to be affected different -- two different ways. I did not interpret that language, the way I read it at the time, as requiring even those tanks that are in the cellar to be -- to then have secondary containment of any leak. That's not the way I interpreted that, and that's not what I agreed to, from my standpoint, as far as sending in my agreement on the consensus language for that matter.

Q. Okay. Well, let's talk about, you know, the task force in general in terms of agreements or understandings that you had as a task force member, pertaining to statements made by other task force members and what industry -- as an industry representative, you were willing to agree to.

Would you please enlighten the Commission as to how that task force process went?

A. Well, I was one of the proponents of the task

force process. I still am a proponent. I think that a lot of these matters could be handled through a task force mechanism to try to work out details that are much more difficult to try to handle in a hearing situation, and I think that there was a good faith effort made on substantially most of the folks and most of the time, as far as working through that.

However, I think I was disappointed, and I think I want to at least frame the nature of the discussion that happened during the task force, at least from my perspective. I'm not speaking for any other task force member.

But I think that you will look through and see that, if not all, the vast majority of all of the green language was industry agreeing to more stringent standards in the various positions or the various parts of the proposed rule. And I think that industry -- the industry members did agree to change -- agree to those positions, based on the concerns that were brought up during the task force hearings.

However, I don't think that -- if I can speak for myself, had I known that there was virtually no -- little or any possibility of being able to leave the cuttings in place, that I would have agreed to a number of those issues, because I think a lot of the things that we agreed

to, I agreed to, had in mind the idea that at least that there was going to be a certain -- a good portion of the drilling pits would be able to be buried in place.

So --

Q. Now Mr. --

A. -- that was in my mind, that's what was happening.

Go ahead, Mrs. Foster.

Q. As to the people that were on the task force that you would have had conversations with, who was actually on the task force working with you?

A. Do you want me to list off --

Q. Well, just --

A. -- all of the task force members?

Q. -- usually they belong to certain groups, or they were OCD --

A. Yeah, well, Dr. Neeper was with New Mexico Citizens for Clean Air and Water. He had a substitute, Dr. John Bartlit, from time to time.

We also had Caren Cowan with the New Mexico Cattle Growers' Association and another gentleman, Phil, but I can't remember his last name now.

Q. Finnegan.

A. Okay, also a surface owner, cattle grower.

We had a representative from the City of

Lovington, who is the city manager. We also had another city manager from the City of Bloomfield.

We had three or four industry representatives, Raye Miller from Marbob, myself, Alan Alexander from ConocoPhillips and Dennis Newman from OXY.

And then we also had a number of people from the OCD in addition to OGAP, Mr. Bruce Baizel.

And then we also had Mr. von Gonten with the OCD, and then I think he was replaced by Mr. Price.

And then we also had another cattle grower -- or landowner from the -- or cattle grower/landowner from the northwest, and I don't remember that gentleman's name.

Q. Now were there any other government representatives, State Land Office or BLM?

A. No, not that I recall. No, there were not.

Q. Now did you -- did you miss any meetings?

A. No, I think I made every single meeting.

Q. Okay. And during these meetings were you in e-mail communication and phone conversation with other members of the committee?

A. Yes, from time to time we did work on certain issues, and ideas were tossed about from one to another.

Q. Okay. So then where did this idea that industry would be able to leave drill cuttings on location -- where did that come from?

A. Well, I think that that was -- at least my understanding, that that was going to be one of the options. And the reason that I say that is because after we got out of the initial kind of discovery portion of the task force where we had various experts come in and talk to us and got into some of the nitty-gritty of the rule writing, we got a -- the proposal of a matrix was brought up.

And the matrix was -- the idea behind the matrix was that it actually tailored the handling of the cuttings based on the drilling system, based on the environmental conditions such as depth to groundwater, and based on the pit contents.

And there was quite a bit of time expended on that idea, and in my mind we were working toward what would be the various acceptable levels that would be either -- and parameters that would require a closed-loop or the use of a pit but then having to dig and haul, or the use of deep trench burial, and then finally what parameters would be used for the actual in-close -- in-place burial.

Q. Now you've read the rule, and you're familiar with the new rule, correct?

A. Yes.

Q. Is there not a provision for on-site closure in the rule?

A. Yes, there is a provision. It has to be beyond 100 miles from a landfill. Also you have to have had -- been able to have had a pit in the first place, based on the siting criteria. And then even in that case you still have to sample, and you are required to do a deep-trench burial.

So no in-place burial is allowed in the rule except through the exception provisions.

Q. Do you not need surface owner approval to do deep-trench burial?

A. Yes, getting on-site burial would require surface owner approval also.

Q. Okay. Now -- so -- did you -- You saw the final draft from the OCD before it was issued to the OCC for this hearing?

A. I saw a final draft for -- that had the language in it for the task force, but that final draft was different than the draft that ended up being presented as the official draft for the purposes of this hearing.

Q. Okay, and as a member of the task force could you tell the Commission substantially how did the two drafts change, the final one from the task force --

A. I don't know -- Between the two drafts, I think, for sure, the 100-mile limit was added in there. I think that also -- if my recollection at this point was that the

draft that we were looking at still had some provisions for the in-place burial.

So it wasn't -- there was a lot of different -- quite a bit of new language added to the official draft that was submitted to the --

Q. Okay, and was there a definition for below-grade tank -- or the proposed new definition for below-grade tank, was that presented to you as a member of the task force?

A. That was not part of the final task force draft that was given to us for review and acceptance.

Q. And yet you had consented to below-grade tank language?

A. Yes, I did, based on my interpretation that because of the discussions that we had in depth in the task force, it was my understanding that those would be treated as two different systems.

Q. And the below-grade tank discussion they have now, is there a deflection device that is discussed or allowed in the below-grade tank, proposed --

A. Yes, there is, in the first -- in the first paragraph that relates to those --

Q. Okay, would banding -- would banding be allowed?

A. Well, banding would have to do with installing what I would call -- I mean, a true secondary-containment

system, and the banding is where you would take a liner, put it down first, then set the tank inside that liner and then use the banding to basically -- like a belt to hold the liner up around the tank, to keep it from filling with rainfall.

Q. And based on the discussion as a task force member, is that a reasonable thing to have to do --

A. To -- or -- well, I think that was a reasonable thing to do to partially buried tanks, and I think that was agreed to -- that was never disputed in this task force, and that was in the present rule.

But I think then taking that and applying that to these tanks that are in the cellars, I think, is excessive and not warranted.

Q. Okay, and how about using double-bottom tanks?

A. Double-bottom tanks is another means of secondary leak detection. It is another option, but I think that the reason operators are shying away from those cases -- and this is more information that I have heard -- is that the -- both the wrapping of the plastic around the bottom of the tank and the double bottoms create areas where water vapor can be captured and condensed, and then you can end up accelerating corrosion on your steel tank.

So they've been problematic, whereas a tank that's more sitting on the ground is -- the ground is

allowed to dry out and you don't have that moist area that is conducive for accelerated corrosion.

So I -- that's really, I think, why operators are -- have moved to the cellar installation rather than this -- rather than this secondary containment in the -- when the first rule was implemented. It wasn't an attempt, I don't think, by industry to dodge the regulation; it was just another way to solve the problem with industry's expertise.

Q. Okay. Now you stated in your background testimony that you are actually the current president of the Independent Petroleum Association?

A. That's correct.

Q. Okay, and in your capacity as president of the Independent Petroleum Association, do you speak to any other economic development groups?

A. Yes, I do.

Q. Yes, and have you spoken to any other groups concerning the economic impact of this rule?

A. Yes, IPANM has issued a letter on the impact that we think that this rule could have on the -- on specifically the San Juan economic development service. I mean, not on the economy of the San Juan Basin, but this letter was submitted to the San Juan economic development service.

Q. Okay, and could you please relate that information to the Commission?

A. Well, we basically related the information that I presented in the slides as far as the kind of impact that we think, and that -- just reading from part of the letter is, for instance, New Mexico's average wager for an industry worker in the oil and gas industry is $52,468 versus the average state wage of $30,628.

In San Juan County, over 9000 people are directly employed in the oil and gas industry of a total work of 50,000, so that's almost 20 percent. This does not include -- and it still doesn't even include trucking or the transportation or retail establishments whose principal business is serving the oil and gas industry.

We estimated something on the order of 30 percent of the -- of the 9000 employees would not be immediately impacted by the rule, because we feel that there's a certain base of core employees that are more involved in the operations and management of the companies that would not be affected as much by a drop in drilling.

But the remaining portion of that 9000, about 60 to 70 percent of those folks, their jobs are more in direct support of drilling. And that includes not only the guy working on the rig, but it includes archaeologists, biologists, other permitting people, truck drivers, any

number of folks, the engineers that are working on the wells, the engineers that are working on the drilling plans in the office, the geologists that are working on the drilling programs. That can have an effect on a very broad cross-section of expertise in the oil and gas industry.

So, and I think -- we just said, losing these high-impact, high-paying positions could have an amplified effect on the entire community.

Q. Okay. Now you've been present for the discussion here and the prior witnesses on this case?

A. Yes, I have, ex- -- I was not here for the very first day.

Q. Okay, but you've been here every other day?

A. Yes, I have.

Q. And did you hear the testimony from Ms. Denomy?

A. Yes, I believe she was the accountant from Oil and Gas Accountability Project.

Q. Okay. And did she not make the statement that -- in fact, that the proposed rule could increase the number of jobs in the oil and gas sector?

A. I believe she did.

Q. Okay, and how would you respond to the increased number of trucking jobs, for example, that could be generated as a result of this proposed rule?

A. Well, I think that that's based on -- the premise

is based on flawed logic. That assumes that we would end up having a similar volume of drilling going on even with this increased cost, and that -- so incrementally, this increased cost would flow into the economy.

However, I think that that would not -- is not going to happen. I think, as I have shown from my slides, that a significant portion of the drilling in the San Juan Basin is based on marginal -- a lot of the wells are marginal, and a significant increase in drilling costs, such as we are contemplating here would actually have a dramatic -- result in a dramatic decrease in drilling -- in drilling in the Basin.

And I don't think that -- also, that you can look at, well, that there is a set pool of money that's going to be drilled -- or used, in the San Juan Basin. And so if they -- now they'll use it because they won't have as much money to drill, so they'll -- they'll just drill less wells. But since each well costs more, that same amount of money will be going into the economy.

That would have to make the assumption that, once again, an oil and gas executive is making the decision that they don't care what the return of the investment on those wells are, we're just going to spend that pot of money.

And so I think in the case that we're talking about here, that a lot of the wells, just because they have

money doesn't mean they're going to spend it if it's not economic. And so there will actually be an exiting of dollars out of the economy of San Juan -- of New Mexico, going to other drilling projects, or -- the oil and gas industry has to compete with other industries to attract capital.

So if we don't meet those thresh- -- or return-versus-risk thresholds of the investment community out there, that money can also be going into other industries, who knows where.

Q. Okay. And as to this -- pertained -- this proposed rule, Rule 17, in your economic analysis, what is your final opinion having done all the economic analysis as it pertains to this pertained -- proposed rule?

A. Well, as I said, I think it wouldn't be unreasonable to see a drop of something on the order of 30 percent of the drilling in the San Juan Basin, and that is -- that's a significant drop, if this rule is implemented as it is written.

Q. And the loss of dollars, based on your economic impact, is that balanced against environmental costs?

A. Not in my opinion. I do not think that based on the total economic benefit versus the potential environmental harm that still has not, in my mind, been defined, versus the potential economic harm that could be

done through implementation of this rule, that it makes sense to do this at all.

MS. FOSTER: Okay, thank you.

Mr. Chairman, Commissioners, I have no further questions of this witness. I would pass the witness at this time.

CHAIRMAN FESMIRE: Mr. Carr, would you have any questions of this witness?

MR. CARR: No, I do not.

CHAIRMAN FESMIRE: Mr. Jantz?

MR. JANTZ: Yes, Mr. Chairman.

CROSS-EXAMINATION

BY MR. JANTZ:

Q. Good afternoon, Mr. Byrom.

A. Good afternoon. Your name is Mr. Jentz?

Q. Jantz --

A. Jantz?

Q. -- Eric Jantz, yes. I'm Eric Jantz, I'm sorry. I'm with the New Mexico Environmental Law Center.

A. I've heard your names mentioned many times. I don't think I quite heard it right, so...

Q. Okay, yeah, Jantz.

There was some discussion that you participated in the task force that made recommendations about this proposed rule; is that right?

A. Yes, that's what the purpose of the task force as.

Q. Right, okay. And part of the purpose of the task force was to make meaningful recommendations to the OCD and Oil Conservation Commission about this rule and what it should be -- what it should look like; is that right?

A. That is correct.

Q. During the course of those task force meetings, did you raise this economic issue?

A. Yes, I did.

Q. And to what extent?

A. I -- Numerous times when we were discussing why don't we just go to closed-loop or why don't we go to 80-mil liners, or whatever the particular topic was, I did mention many times that the -- there were economic consequences to those kinds of decisions.

Q. Did you have these graphs?

A. No.

Q. Did you have this level of detail of economic analysis during those task force meetings?

A. No, I did not. I think there was -- there was quite a bit of information that was provided more on an anecdotal basis rather than in exact details, but we did discuss and have some indication of the incremental drilling cost this process would have. So I'm sure that --

I know that we talked about effects in the order of $100,000 to $200,000 cost per well, and that that would have an impact.

Similarly, we talked about groundwater contamination. And I've seen quite a bit of detailed information during -- I've seen more information presented during the hearing than was ever presented in the task force. There was no modeling done, there was no discussion specifically about soil migration to the extent that came anywhere close to what we've seen in the task force --

Q. But if you were talking about $150,000 to $200,000 per well additional cost due to the new rule, it would have been possible to make these sort of calculations for the task force, would it not?

A. It would have --

Q. And --

A. -- if we had had -- once again, I think the impact of that -- I think it was clearly stated that that was going to have a major impact, but we didn't provide exact data to this level of detail.

Q. And that probably would have been helpful?

A. I think a lot more data would have been helpful. I think we were -- had deadlines that we had to meet with the task force, based on the Secretary's -- Secretary of Energy, Mineral -- Miner- -- Can I say it? -- Energy,

Minerals and Natural Resources, that she had certain objectives for the task force.

So we did not have an open-ended time. There was a real rush to gather data, in my opinion. And I think that we did get quite a bit of information in. Dr. Neeper did have some data that he presented, we -- Marbob went and made the -- drilled those core wells with Dr. Neeper, the industry provided information on actual sampled pits. And so I think that was a good start.

But I think as you've seen in the hearing, we're now just getting into models, and there's a lot of discussion about input parameters that, in my mind, certainly would lend themselves to further study, that we did not have time to address in the task force.

Q. But you are saying that this level of detail and these sort of graphs weren't provided to the task force prior to the hearing?

A. That's correct, no, that's right.

Q. Let me go into a little bit about your background again. Your background, as I understand it, prior to becoming management in D.J. Simmons, is as an engineer; is that right?

A. That's correct.

Q. As a petroleum engineer, you weren't --

A. Can I interrupt the question for a correction,

or --

Q. Please do.

A. -- is that improper?

Q. It's okay.

CHAIRMAN FESMIRE: If you have a correction to your answer, it would be proper to --

THE WITNESS: Okay, thank you. I have a degree in mechanical engineering --

Q. (By Mr. Jantz) Mechanical --

A. -- so I'm --

Q. Mechanical engineer, I'm -- I apologize.

As a mechanical engineer, you don't have a background in hydrology; is that right?

A. No, I do not.

Q. Nor soil science?

A. No.

Q. Contaminant transport?

A. Well, I say soil science. I actually worked the summers at a soils testing laboratory, so I do have some experience in soil science, but it would be -- was limited to summertime work during my college years.

Q. Okay, that doesn't include contaminant transport, for example?

A. No.

Q. Or contaminant transport modeling?

A. No.

Q. You don't have a background in public health; is that right?

A. That's correct.

Q. At the end of your slide presentation, your Exhibit 32, you drew the conclusion that there would be serious economic impacts on the San Juan Basin if this proposed rule were enacted. At the same time, it didn't balance out against the public health and environmental risks?

A. That's correct.

Q. The latter part of that conclusion, however, is just a lay opinion, is it not?

A. No, I think it's more than a lay opinion. I participate in the full task force in 2007. I've reviewed this information, I've sat through this hearing, listened to however many days we've been here, 12 days or whatever it is of testimony, and -- in addition to the work that we did in 2003, and I sat through those hearings and saw the presentations by Dr. Neeper as well as, I think, Mr. Randy Hicks back then at that time.

And so I'd say that my opinion is better than what I would just characterize as a lay person's opinion.

Q. So by virtue of sitting through these proceedings, you become more than a lay person?

MS. FOSTER: Objection, argumentative.

CHAIRMAN FESMIRE: Sustained.

(Laughter)

Q. (By Mr. Jantz) Let me ask it this way --

CHAIRMAN FESMIRE: You're one for one today, Karin.

(Laughter)

MS. FOSTER: Thank you.

Q. (By Mr. Jantz) Does the fact that you have participated in these hearings make you an expert on hydrology, environmental health, public health or risk analysis?

A. No, I would not try to qualify myself as an expert in this hearing --

Q. Okay, thank you.

A. -- in that -- in those categories that you've just mentioned.

Q. Okay. Let me see -- Okay, if we go into -- if we take a look at your -- the first few slides that you presented --

A. I'm just going to scroll back up and you can tell me --

Q. Yes, please.

A. -- where to stop.

Q. Actually, the one where you start getting into

the graphs with the 100,000 MCF --

A. Like that one?

Q. Exactly.

A. Okay.

Q. The -- Let me see if I understand sort of the proposition of this --

A. Yes, sir.

Q. -- and that is that there is this cutoff point right about at 100,000 MCF where the calculus of whether to drill a well changes; is that right?

A. Yeah, I don't know that it's a specific -- I think that there is a -- it's a cutoff point, but it is -- it's an area in which, well above that line, you start to clearly have economic wells, and when you start approaching that line below that line, you get into the area what I would call a marginal well.

Q. So it's more of a range?

A. Yes, it would be a range --

Q. Okay, and --

A. -- based on, of course, a number of variables.

Q. Sure. And one of those variables is the price of the commodity; is that right?

A. That's correct.

Q. Oil?

A. Yes.

Q. So as the price of oil or gas rises, the range or this line changes, it would go lower?

A. Well, actually, as this -- yeah, that's right, as this -- if you were to raise gas prices, the line would go lower, you're correct, because there would be less production needed in order to generate that same kind of revenue.

Conversely, if prices were to drop, then that line would float upward.

Q. So a lot of this is contingent on market conditions, is it not?

A. Market conditions is one of the driving factors, yes.

Q. So the more demand there is for a particular commodity, the higher the price goes, the lower this line goes, the lower the range goes; is that right?

A. Generally, but that's assuming that all the other variables stay flat themselves, if you're going to modify one variable.

But in reality, as we have seen over the past few years, we've seen the commodity prices go up substantially. We were -- as recently as 2002, we were below $2 an MCF -- or $2 an MMBTU for gas, natural gas.

But -- I'm just guessing, but I don't think, if I were to generate this graph based on those economic

parameters and what we could drill a well for, based on the cost of services, that I -- I would guess that, based on what I've seen, that that graph would look very similar to what it does now.

And so I guess the answer to your question is that the increased demand for a commodity not only increases the price of the commodity, but since there's an increased drive to get that commodity, then the associated services and goods and materials that are required to harvest that commodity tend to go up in a similar fashion.

Q. Well, I mean, this sort of makes an interesting point that there are a lot of different factors that can go into this; is that correct?

A. That's correct.

Q. So for example, an additional factor that you might consider would be pipeline capacity to shift the commodity; is that right? That might have an effect on production, right? And --

A. Pipeline capacity would and does have an effect on the commodity pricing. As we've seen up in Wyoming, the commodity pricing is very low due to commodity pricing -- I mean, excuse me, due to pipeline constraints, and they're hoping that that will change here shortly.

Q. So --

A. Well, I -- just to finish my -- I apologize for

interrupting here --

Q. Sure, sure.

A. -- but they think -- they hope to change that soon because there's going to be new pipeline capacity coming on here around the beginning of the year --

Q. Okay.

A. -- so for instance, your point is correct in that the pipeline capacity is another factor on commodity pricing.

Q. When you assume this price -- this range about whether a well would be economic or not --

A. Yes.

Q. -- is this a -- and I'm sorry to steal your thunder, Mr. Chairman, but is this a pre-tax or a post-tax analysis?

(Laughter)

A. I actually use for the analysis, I use pre-federal income tax numbers.

Q. And so that might change this range as well?

A. I don't know --

Q. A post-tax analysis?

A. As far as -- What I was doing is, I was looking at the economic threshold for the particular well. So whether or not I do my analysis on a pre-tax basis, based on appropriate threshold for that, or if I were to do it on

a post-tax basis, based on another threshold, I don't think that it's going to have much effect at all on this graph that we're talking about here.

Q. Even the incremental cost? Because I've been seeing --

A. Uh-huh, yeah.

Q. -- in some cases the incremental costs are -- for the closed-loop system, for example, are an intangible cost. And it's my understanding -- and I'm probably way out of my depth here, and I'm sure you're going to tell me if I am -- that that is essentially something that a company can expense; is that right? In which case, this calculus -- it seems to me that the dotted line would not be that far above the solid line.

A. Well, Mr. Fesmire has really got to be -- I'm just saying -- Chairman Fesmire probably -- brought this point up, and I think it's a valid point to discuss, because the -- with initial blush you say, Well, additional drilling costs can just simply be written off.

And so the true cost -- the incremental cost of that drilling, since it is what is categorized as an intangible drilling cost, would be able to be expensed in a normal tax year directly against your revenue, similar to other expenses that you would incur, such as employee expenses or rent for your building and that kind of thing.

The difference, though, is, if you -- number one, Mr. Mullins mentioned alternative minimum tax. There are IRS restrictions of intangible drilling costs, so sometimes those all cannot be used. I know in a lot of companies that is a definite hinderance of using altern- -- or, as alternative minimum tax.

And it's not just for small companies. Large investment groups are formed with LLCs, and those profits tend to flow back directly to the individuals in those LLCs and master limited partnerships. So it can be a fairly large portion of the investment community, can be subject to alternate minimum tax. And talking to my accountant, he indicated that even C corps would have -- could be affected by that.

So the other part of that is that you're still having to pay taxes on that -- or pay taxes on the revenue, so my calculations don't take into account that I'm paying taxes on the revenue either.

And also, if you -- in the alternative, if I were to look at a normal depreciation of those wells, if I were to, say, buy the wells, then they're depleted as the production is drawn off, based on the basis that I have -- economic basis that I have in the property. So I'm still able to write that off, it's just over more time as the well is depleted.

And as you saw in those graphs, the depletion of that asset is accelerated because the production of the well is accelerated, it's not a linear decline.

So it becomes more of a calculation of the time-value of money. Do you write it off immediately, or do you write it off over time? And then that goes back to your net present value calculations and the DCF calculations.

And that's why the numbers that I picked basically -- a pre-tax response or a pre-tax threshold takes all of those nuances into account. And like I said, they are nuances, and they adjust up and down.

But basically I think this graph is accurate as far as looking at the general area where I would draw a line to say these wells in this area are more marginal, and clearly the wells above the graph, well above the graph, are not.

Q. Well, I --

A. Is that a sufficient answer?

Q. That's more than sufficient for me. I'm sure --

A. All right.

Q. -- Chairman Fesmire will thank me later for letting you explain in such detail.

One last series of questions, I guess.

When you're talking about the wells that are being drilled -- and I can't remember which slide it was.

It was maybe slide 10? Yeah, that's the one.

A. That is a Dakota-Mesaverde well. Is that the one that you wanted, the --

Q. Yeah, I think that's the one.

A. Okay.

Q. Now each -- you mentioned that there were 500 -- about 500 -- 700-some wells drilled --

A. Yes.

Q. -- here --

A. Yes.

Q. -- and that about 550 or so of them produced below 200,000 MCF; is that --

A. Yeah, that was just a number that -- well, you can -- well, let me go back up to the -- I think the graph that you're talking about. This one.

Q. Yeah --

A. And I do want to make a point, and I -- that's just coming to me now. I didn't show a graph on the Fruitland Coal production. I alluded to it that it was a cutoff of around, I thought, 50,000 MCF. I don't mean to interrupt you, but I think that it's important, that the -- So that -- the Fruitland Coal wells drilled in that year were about half of those wells drilled in that year.

So if you kind of add them up, that's why there's a number of wells that -- if you look at the Mesaverde-

Dakota, Pictured Cliff wells that I discussed, the other ones are Fruitland Coal and then a few other various formations such as Gallup, Chacra, I think there was even a couple of Paradox wells on that list. So just for clarification of my previous testimony.

Q. Sure. Each one of those wells was not drilled by a different operator, though, was it?

A. I'm sorry, this graph that I'm looking at, which would be page number 10 in the exhibit, because I'm off by one --

Q. That's production --

A. -- this is -- these are all of the wells that were drilled in the San Juan Basin of New Mexico, which includes a number of counties, in 2004 by all of the operators.

Q. So -- But each well was not drilled by a separate operator; is that correct?

A. No, I guess -- There's some operators that drill a lot more wells than other operators, so you can see according to my data --

Q. Right.

A. -- that 180-some wells were drilled by Burlington Resources --

Q. And it looks -- it looks like the production -- some of the higher production wells offsets the production

of some of the lower production wells; is that right?

A. Well, generally, that is the -- in this case, the lower-production wells are wells that the company made an evaluation on, and I'm sure some of those wells, especially down toward the far left of the curve, are definitely uneconomic. And if they had their choice to -- if we could only drill a well and get it on production and then decide if we're going to pay for it, I would go for the closed-loop drilling, if that was the case.

(Laughter)

A. But -- So in this case it shows that there were a number of wells that came in well below what they were hoping to get.

And then the wells off to the right are either what they expected because they are meeting, clearly, even if they were very expensive wells, which there are some very expensive wells drilled, but -- you know, just assume that you double the threshold to 200,000, there are still some wells that Burlington Resources drilled that were very, very economic. It almost makes me cry to look at this graph.

(Laughter)

Q. But on average, it looks like they're doing pretty well.

A. It looks like Burlington Resources on average is

doing pretty well.

MR. JANTZ: Excellent. Okay, that's all I have. Thank you, Mr. Byrom.

CHAIRMAN FESMIRE: Since some of the folks have -- Well, let me ask. I'm assuming that except for Mr. Brooks there's no other cross-examination of this witness, and the Commissioners.

DR. NEEPER: There would be a few questions.

CHAIRMAN FESMIRE: Oh, Doctor, how long would it take?

DR. NEEPER: It would take 15 or 20 minutes, so it's fine to postpone that.

CHAIRMAN FESMIRE: Okay. Given the weather and the folks that have to drive back to Farmington, I think we'll go ahead and adjourn for today, to reconvene back here at nine o'clock Monday morning. Okay?

Thank you all.

MR. BROOKS: Do we need to confer with the attorneys about scheduling again? Because we left an item unresolved.

CHAIRMAN FESMIRE: That's right.

MR. BROOKS: I assume there's no one here who wants to make a comment.

CHAIRMAN FESMIRE: Oh, yes, I'm sorry. I didn't notice anybody that wasn't here before, so -- Does anybody

need to make a comment on the record?

Okay, now we'll adjourn.

Thank you all very much for your patience.

(Thereupon, evening recess was taken at 4:37 p.m.)

* * *

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 January 27th, 2008.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 16th, 2010