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**Statement of Michael Hardy, Ph.D.**

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STATEMENT  
OF  
MICHAEL HARDY, Ph.D.

Taken pursuant to Notice by Richard  
J. Lipuma, CCR, a Court Reporter and  
Notary Public in and for the  
Commonwealth of Pennsylvania, at  
Agapito Associates, Inc., 715 Horizon  
Drive, Grand Junction, Colorado, on  
Thursday, February 7, 2007 beginning  
at 10:30 a.m.

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1                   P R O C E E D I N G S

2           -----

3   MR. ZELANKO:

4   My name is Joe Zelanko.

5       I'm an accident investigator  
6       with the Mine Safety & Health  
7       Administration, an agency of  
8       the United States Department  
9       of Labor. With me is Tim  
10      Williams of the Solicitor's  
11      Office. We'll be conducting  
12      the questioning today.

13   I, together with other  
14      government investigators and  
15      specialists, have been  
16      assigned to investigate the  
17      conditions, events, and  
18      circumstances surrounding the  
19      fatalities that occurred at  
20      the Crandall Canyon Mine in  
21      Utah in August 2007. The  
22      investigation is being  
23      conducted by MSHA under  
24      Section 103(a) of the Federal  
25      Mine Safety & Health Act, and

1 the Utah Commission of Labor.  
2 We appreciate your assistance  
3 in this investigation.  
4 After the investigation  
5 is complete, MSHA will issue a  
6 public report detailing the  
7 nature and causes of the  
8 fatalities in the hope that  
9 greater awareness about the  
10 causes of accidents can reduce  
11 their occurrence in the  
12 future. Information obtained  
13 through witness interviews is  
14 frequently included in these  
15 reports. Your statement may  
16 also be used in other  
17 proceedings.  
18 You may have a personal  
19 representative present during  
20 the taking of this statement  
21 and may consult with your  
22 representative at any time.  
23 Your statement is completely  
24 voluntary. You may refuse to  
25 answer any question, and you

1       may terminate your interview  
2       at any time or request a break  
3       at any time. Since this is  
4       not an adversarial proceeding,  
5       formal Cross Examination will  
6       not be permitted. However,  
7       your personal representative  
8       may ask clarifying questions  
9       as appropriate.

10      A court reporter will  
11       record your interview. Please  
12       speak loudly and clearly. If  
13       you do not understand a  
14       question asked, please ask me  
15       to rephrase it. Please answer  
16       each question as fully as you  
17       can, including any information  
18       you have learned from someone  
19       else.

20      I would like to thank  
21       you in advance for your  
22       appearance here. We  
23       appreciate your assistance in  
24       this investigation. Your  
25       cooperation is critical in

1 making the nation's mines  
2 safer.  
3 After we have finished  
4 asking questions, you will  
5 have an opportunity to make a  
6 statement and provide us with  
7 any other information that you  
8 believe to be important. If  
9 at any time after the  
10 interview you recall any  
11 additional information that  
12 you believe might be useful,  
13 please contact Richard Gates  
14 at the telephone number or  
15 e-mail address ---. And I'll  
16 give you Richard's card there.

17 ATTORNEY WILLIAMS:

18 Let me just note at  
19 this time we would normally  
20 swear in the witness prior to  
21 the questioning beginning, but  
22 it's my understanding that Mr.  
23 Hardy, through Counsel, has  
24 expressed --- has declined to  
25 be sworn; is that correct?

1 ATTORNEY MENK:

2 Yes, it is.

3 BY MR. ZELANKO:

4 Q. Would you please state your  
5 full name and address for the record?

6 A. Michael Hardy, Michael Peter  
7 Hardy. What address do you want?

8 This address? (b) (7)(C)

9 (b) (7)(C)

10 Q. Doctor Hardy, do you have any  
11 questions about the interview process  
12 as I described it?

13 A. No.

14 Q. Do you have a personal  
15 representative with you here today?

16 A. Yes.

17 MR. ZELANKO:

18 Would your personal  
19 representative identify  
20 himself by name and address  
21 for the record?

22 ATTORNEY MENK:

23 Yes. Bruce Menk,  
24 middle initial A, with the law  
25 firm of Hall & Evans, LLC,

1 1125 17th Street, Suite 600,

2 Denver, Colorado.

3 MR. ZELANKO:

4 Okay.

5 BY MR. ZELANKO:

6 Q. Doctor Hardy, are you  
7 appearing here today voluntarily?

8 A. Yes.

9 Q. I just wanted to begin by  
10 saying our purpose here today is to  
11 clarify a few things that we've seen  
12 in some of the information that  
13 you've provided us. And I know it's  
14 difficult at times to put yourself  
15 back in time and say, well, this is  
16 what I knew now versus what I knew  
17 then versus what I know now. And  
18 what I'd suggest is that you don't  
19 limit, you know, your knowledge to  
20 what you might have known at a given  
21 time. But if it's important to  
22 clarify when the information you have  
23 was obtained, then feel free to do  
24 so.

25 I wanted to thank you in

1 advance for your help in  
2 understanding some of the  
3 information. The written responses  
4 were really helpful.

5 To begin, on the written  
6 response, there was no cover letter.

7 Can you help us understand, who put  
8 that document together?

9 A. Kim. She --- well, we  
10 provided information and Kim put it  
11 together. That's my understanding.  
12 And you forwarded it to them.

13 ATTORNEY MENK:

14 Right.

15 BY MR. ZELANKO:

16 Q. We being? I mean, you put the  
17 information together or you and  
18 others on your staff?

19 A. Me and others on my staff,  
20 yeah.

21 Q. Okay. I have ---.

22 ATTORNEY WILLIAMS:

23 Just so the record is

24 clear, I'm sorry, Kim is Kim

25 Greathouse; right?

1 A. Yes.

2 BY MR. ZELANKO:

3 Q. I brought a number of  
4 documents with me here today. So  
5 that as we're talking with him, if  
6 I'm referring to a specific question,  
7 it won't be taken out of context.

8 You can look at it and it will be in  
9 full context of the thing we're  
10 talking about. So we'll be handing  
11 some of those out. I saw you brought  
12 with you some information as well.

13 But I'll begin just by saying the  
14 response --- we brought a copy of the  
15 response for you to refer to.

16 A. Well, I have it with me.

17 MR. ZELANKO:

18 Okay. You can use that  
19 one, I guess. We were going  
20 to put this one in as Exhibit  
21 One. It's just a copy, again,  
22 of the written response that  
23 you gave us.

24 (Michael Hardy Exhibit

25 1 marked for

1 identification.)

2 BY MR. ZELANKO:

3 Q. Okay. In question four of  
4 that response we asked you to  
5 describe the management process at  
6 AAI. Is that how you refer to  
7 Agapito, as AAI, or just Agapito?

8 A. Agapito most of the time. But  
9 in written documents it's usually  
10 abbreviated down to AAI.

11 Q. If I say Agapito, we'll know  
12 that we're talking about?

13 A. Yes.

14 Q. Would you elaborate a little  
15 bit on the project management  
16 process? And walk us through a  
17 typical project workflow from the  
18 time say a client calls you or  
19 someone on your staff initiates a  
20 project, how would a typical project  
21 go?

22 A. Well, I'm sure you're asking  
23 me about a typical project in the  
24 context of Genwal, because a typical  
25 project, you know, some of them are

1 million-dollar projects and some of  
2 them are \$5,000 projects. With  
3 Genwal it's typically a \$5,000 to  
4 \$15,000 job, and it's a request that  
5 comes typically from Laine Adair  
6 verbally to look into something.  
7 Sometimes with some clients we have a  
8 regular arrangement where we are  
9 expected to go visit the mine on a  
10 routine basis. And sometimes we  
11 might get a call from someone like  
12 Laine saying, it's about time you  
13 came out again. It's six months since  
14 you came. We've progressed here and  
15 we progressed there.

16 There may be an issue. There  
17 may not. So we go and do a field  
18 visit. And there may be a write-up  
19 of it after we've been there if there  
20 was some issue that they wanted us to  
21 write up about.

22 Sometimes it's specifically to  
23 an issue of design. They want to now  
24 move here, go there, do something  
25 different, and they want to review

1       whatever their plan might be or  
2       whatever their concept might be. So  
3       we typically send them a cost  
4       estimate to do something. That might  
5       include going to visit the site and  
6       then fine tune that estimate after we  
7       talk to them a little bit more at the  
8       project site. But typically there's  
9       a project, a job number established,  
10      you know, somebody is in the lead  
11      role in the project.

12     And other people might help,  
13      you know, do some analysis, or do  
14      graphics, or whatever. And a report  
15      is written, write an e-mail to the  
16      client. Typically, a draft is sent,  
17      maybe an e-mail statement, not really  
18      a letter report or a project report.  
19      And there's some discussion because  
20      there may be some new information  
21      that is available and edited and then  
22      issued.

23     And most of the time it will  
24      go through a draft report or a draft  
25      letter report. Again, I might look

1 at it, I might comment upon it and it  
2 will be issued as final. And that  
3 would close out the project. On a  
4 typical project, just to continue ---  
5 that's a typical small project.

6 Q. Okay.

7 A. Early on with Genwal we did  
8 some larger projects involving ---  
9 before they started, before the new  
10 ownership. This is back in the early  
11 '90s. That would be a slightly  
12 larger project. And since that time  
13 it was more of the Band-Aids and  
14 small jobs.

15 Q. Are there any written company  
16 policies about how that sort of thing  
17 is handled, how the workflow ---

18 A. Uh-huh (yes).

19 Q. --- when the call comes in?

20 A. Uh-huh (yes).

21 Q. It's all laid out?

22 A. Uh-huh (yes).

23 Q. Okay.

24 A. Well, you know, we have  
25 engineering procedures.

1 Q. If it's a written policy, is  
2 there any chance we could take a look  
3 at that or get a copy of that?

4 ATTORNEY MENK:

5 Why don't you send us a  
6 request for what you want, ---

7 MR. ZELANKO:

8 Okay.

9 ATTORNEY MENK:

10 --- and then we'll take  
11 a look at it and determine  
12 whether it's something we can  
13 give you or not.

14 MR. ZELANKO:

15 Okay.

16 BY MR. ZELANKO:

17 Q. Are there any procedures  
18 specifically regarding numerical  
19 modeling in your written work  
20 policies?

21 A. I don't know. No.

22 Q. All right. Could you walk us  
23 through --- that was a typical  
24 project. Could you walk us through  
25 specifically --- well, there's a

1           , the pillaring analysis for Crandall  
2 Canyon and how that --- someone  
3 called and said we want to do some  
4 analysis --- we'd like you to do some  
5 analysis, from then on.

6           A. Well, as you probably know,  
7 you know, I'm the president of  
8 Agapito Associates, so I'm not  
9 involved in every project. In this  
10 case, in this project, I was very  
11 little involved. I've been involved  
12 in Genwal for a long time, going back  
13 to the beginning. But case in point,  
14 this particular project, the one  
15 beginning in the middle of '06,  
16 relating to the mining of the  
17 pillars, the barrier pillars, I was  
18 not very much involved, particularly  
19 in the first two rounds of reports,  
20 which are the July and August  
21 reports. I did go out and visit the  
22 mine in December, after there was  
23 some initial mining. And I visited  
24 the mine after the collapse or the  
25 bouncing of the north barrier.

1 But the --- another principal  
2 in our company, Leo Gilbride, was the  
3 project manager for this work, for  
4 number 20 you're just specifically  
5 referring to. He now is no longer an  
6 Agapito employee, not anything to do  
7 with this case, or this event, but  
8 that puts us in a little bit more  
9 awkward position than if he was still  
10 an employee. He participated in all  
11 the work that we're involved in  
12 currently, and contributed in a  
13 little way to some of the responses  
14 here.

15 So I believe what happened,  
16 and I think this is what happened, is  
17 Laine called here regarding that and  
18 Leo did the analysis and the work  
19 that they referred to. He and Bo Yu  
20 was on the analysis and our staff.  
21 So does that answer some of the  
22 question?

23 Q. You think that Laine called  
24 Leo and Leo initiated the project?

25 A. That might have been the first

1 contact. I'm not quite sure about  
2 this. The first contact might have  
3 been with Laine. Leo wasn't here and  
4 I wasn't here, and Laine talked to  
5 Gary Skaggs, who was also on staff  
6 here. But it wasn't very long before  
7 contact was made between Leo and  
8 Laine and the project moved forward.

9 ATTORNEY WILLIAMS:

10 Doctor Hardy, the court  
11 reporter has indicated to me  
12 that he's having some trouble  
13 understanding you, so if you  
14 could raise your voice a  
15 little, that would be great.  
16 And maybe you could pull that  
17 microphone towards you a bit  
18 as well. Maybe that would  
19 help. Thank you.

20 BY MR. ZELANKO:

21 Q. Who were the engineers, senior  
22 associates, and principals over the  
23 course of that project 20, the  
24 pillaring analysis?

25 A. Leo and Bo Yu. And I think

1           there was some involvement with Dave  
2           Conover in our Denver office. I  
3           think that's pretty much who  
4           contributed.

5           Q. Could you spell Mr. Conover's  
6           name, please?

7           A. C-O-N-E-E-V-E-R; is that  
8           right?

9           MS. GREATHOUSE:  
10          C-O-N-O-V-E-R.

11          A. One E.

12          MS. GREATHOUSE:

13          One E.

14          MR. ZELANKO:

15          Thank you. Okay.

16          Let's look at another exhibit.

17          You provided us with a copy of

18          the proposal, I guess, that

19          Agapito put together for

20          Genwal. This proposal, we're

21          going to call it Hardy Exhibit

22          Two.

23          (Michael Hardy Exhibit

24          2 marked for

25          identification.)

1 BY MR. ZELANKO:

2 Q. On page eight of that --- and

3 I'm referring to the Bates number.

4 And I'll try to do that throughout,

5 use the Bates number, yeah. That

6 labor estimate included hours for

7 principal, senior associate and

8 senior engineer. Do you know ---

9 first of all, what is the distinction

10 between those titles, senior

11 associate, senior engineer, engineer,

12 principal?

13 A. It generally reflects

14 experience base.

15 Q. A principal would be the most

16 experienced?

17 A. The principal would be the

18 most experienced.

19 ATTORNEY WILLIAMS:

20 Would that also reflect

21 ownership in the company?

22 A. Yes. Senior associate is the

23 next most experienced person. He's

24 the most senior --- many years of

25 experience. The senior engineer

1       would have less. The engineer  
2       technician is, in fact, our AutoCAD  
3       operator. And the word processor is  
4       as it sounds.

5       BY MR. ZELANKO:

6       Q. Do the senior associate or  
7       senior engineer have a supervisory  
8       responsibility in the projects or are  
9       they purely technical positions?

10      A. You said a senior associate or  
11      a senior engineer?

12      Q. Senior associate first.

13      A. Okay. Yes.

14      Q. They do?

15      A. Uh-huh (yes).

16      Q. Do you know who those titles  
17      refer to in this case?

18      A. I don't know because Leo wrote  
19      this and I would have thought he put  
20      a lot of his time in there, unless he  
21      said he was not going to put his time  
22      in here, because he did put his time  
23      in here. So whatever this is, this  
24      was done in May, on the 6th. And I  
25      don't know who was taking over the

1 senior associate.

2 Q. In the chart that you provided  
3 us on the first page there, is it  
4 9948, how many senior associates were  
5 in the company at that time?

6 A. It would be Gary Skaggs, Brian  
7 McGunegle, John Tinucci. I think  
8 that's it.

9 Q. Does Gary Skaggs appear in the  
10 summer of '06 on your chart?

11 A. No, he does not. I think he  
12 joined --- I think he joined us a  
13 little bit afterwards.

14 Q. Okay.

15 A. Yeah, a couple weeks later.

16 Q. So would Leo then, in this  
17 proposal, have been referring to  
18 Brian McGunegle or John Tinucci  
19 as ---?

20 A. No.

21 Q. No?

22 A. I don't know who he's  
23 referring to, but I think he intended  
24 to do the work himself. And one  
25 reason he came out like this ---.

1 Q. Okay.

2 A. It's not that important. I  
3 mean, it's really --- what the client  
4 sees is the bottom line in the  
5 discussion that's proposed to them.

6 Q. In terms of supervisory  
7 responsibility for the work, though,  
8 it would have either been the  
9 principal or the research associate;  
10 is that correct, that would be ---?

11 A. It would have been the senior  
12 associate or the principal. But in  
13 this case, it was the principal, ---

14 Q. And it was ---?

15 A. --- because there was no  
16 senior associate. I don't think there  
17 was really much time during the job  
18 from the senior associate.

19 Q. And you feel, based on what  
20 you're seeing there, that Leo  
21 intended to be that person,  
22 regardless of what the hours would  
23 have been?

24 A. He certainly was. I don't  
25 know what he was thinking when he put

1 this out, but he'd be the principal.

2 He put it out without me reviewing

3 it.

4 Q. Who was involved from the

5 Genwal side of this project

6 initiation? You had mentioned Laine

7 called earlier.

8 A. Uh-huh (yes).

9 Q. Was there involvement of other

10 folks at ---?

11 A. Well, I can't answer that

12 entirely because I didn't participate

13 in any of those conversations. But

14 Leo has told me that he discussed

15 this with Laine and not John Lewis,

16 for example. John Lewis is another

17 participant that we'd deal with and

18 get information from. But I don't

19 think there was very much interaction

20 between them.

21 Q. Did Leo Gilbride's role change

22 over the course of the project?

23 A. Yeah. He went into a --- the

24 beginning of the year, the beginning

25 of '07 he went into a part-time

1 position as a contract employee but  
2 still maintained the title of  
3 principal. He was still an owner.

4 Q. Okay.

5 A. So he transitioned from this  
6 to a different position.

7 Q. In some of the information you  
8 provided us, we see that Bo Yu did  
9 some numerical modeling, Hua Zhao ---  
10 is that the right pronunciation?

11 MS. GREATHOUSE:

12 Hua Zhao (corrects  
13 pronunciation).

14 BY MR. ZELANKO:

15 Q. Hua Zhao. And also Dave  
16 Conover. Why were different  
17 engineers involved at different times  
18 in the project?

19 A. Well, Dave Conover's role was  
20 limited to some of the model  
21 characteristics that were used in the  
22 model. And I think that's the limit  
23 of what his involvement was. That  
24 was relatively early on. That model  
25 was used throughout the model we use

1 now. Bo did most of the modeling and  
2 Hua did some of it. And I really  
3 can't tell you which day of the week  
4 Hua was on the project and what he  
5 did, but I think most of them were  
6 done by Bo.

7 Q. Who would have made those  
8 decisions to have Conover involved  
9 initially then ---?

10 A. Leo.

11 Q. And you described your  
12 personal role in the project earlier  
13 as ---?

14 A. Minimal.

15 Q. Minimal?

16 A. Yeah. Because the reports  
17 were written and went out. I wasn't  
18 involved in the review of the first  
19 two reports. I was involved in  
20 getting out to the mine in December  
21 and at the end of March, not the  
22 first two reports.

23 ATTORNEY WILLIAMS:

24 Do you know if Mr.

25 Gilbride determined which

1 engineers would work on the  
2 project at which time based on  
3 their specialty, or their  
4 availability, or ---?  
5 A. Specialty. Both Hua and Bo  
6 would have done a lot of analysis  
7 like this, and Dave Conover had done  
8 it for a long time as well.

9 BY MR. ZELANKO:

10 Q. You said you didn't review the  
11 first two reports. Did you review  
12 the last report, April ---

13 A. Yeah.

14 Q. --- 18th? Okay.

15 ATTORNEY WILLIAMS:

16 Did you say you didn't  
17 review the first two?

18 A. Yeah, the first two.

19 BY MR. ZELANKO:

20 Q. Who selected the types of  
21 analyses to be done for that Project  
22 20 at Crandall Canyon?

23 A. Again, that's very similar to  
24 other projects we've done, and that's  
25 what was proposed.

1 Q. And the analyses that were  
2 done were LAMODEL and ARMPS?

3 A. Uh-huh (yes).

4 Q. Were there any other types of  
5 analyses done?

6 A. I don't think so.

7 ATTORNEY WILLIAMS:

8 I'm sorry to interrupt  
9 again. Doctor Hardy, can you

10 try to say yes or no because  
11 he can't take down nods or  
12 uh-huhs or ---. Thank you.

13 BY MR. ZELANKO:

14 Q. And who actually did the  
15 LAMODEL analysis? You think Bo did  
16 most of them?

17 A. And Hua would have done some  
18 at different times.

19 Q. Do you know who selected the  
20 areas that were used for calibration?

21 A. Yeah.

22 Q. Did a principal or senior  
23 associate assist with the LAMODEL  
24 calibration?

25 A. The calibration has got a long

1 history, and that goes back to the  
2 early '90s, middle '90s, when they  
3 were using EXPAREA, which is a  
4 different code, a very similar code,  
5 in comparison with some feedback from  
6 instrumentation. The other parts of  
7 the calibration is purely from  
8 experience or observations of the  
9 mine, of pillar yield, rib sloughage  
10 and that sort of thing. And so those  
11 things all contributed to what  
12 actually the final numbers are that  
13 are being used in the LAMODEL model.

14 Q. Who did the calibration of the  
15 model that was used at Crandall  
16 Canyon? It incorporated properties  
17 from previous models, the EXPAREA?

18 A. Right.

19 Q. But the models looked at the  
20 mobile bridge conveyor sections up in  
21 Section 36, I think they referred to  
22 it. That model was portrayed as a  
23 calibration in the work that was  
24 done. Who did the calibration?

25 A. The model was done by Bo and

1 the interpretation was by Leo. In  
2 other words, we adjusted one of the  
3 parameters, the strength of the coal.  
4 It started off with it being a low  
5 number, 700 or 900, I'm not sure.  
6 You have to check the numbers. And  
7 that indicated that if you used that  
8 number, all the mains pillars would  
9 have collapsed. And that wasn't the  
10 case. The mains, the people had used  
11 for many, many years and there was  
12 some modeling of what happened in  
13 those retreat mining pillars as well.  
14 So that was the main motivation for  
15 raising the value to whatever it was,  
16 1620. That was a calibration based  
17 on field observations or conditions  
18 of the ground.

19 Q. So Bo ran the models and he  
20 brought results to Leo. Leo  
21 interpreted the model and said, do  
22 this, ---

23 A. Uh-huh (yes).

24 Q. --- make this change?

25 A. Yeah.

1 Q. Okay. The proposal that we've  
2 labeled Exhibit Two identified two  
3 areas for calibration, the one that  
4 we discussed, the mobile bridge  
5 conveyor sections, and the other one  
6 was the south mains pillar retreat  
7 section. Was the south mains area  
8 actually used for calibration?

9 A. No.

10 Q. No? Do you know why not?

11 A. I think Leo said that it  
12 was --- a better calibration was up  
13 in the north, it was closer and it  
14 had more depth of cover similarities.  
15 I believe that's why he didn't redo  
16 that.

17 Q. Okay. So Leo was involved in  
18 the calibration. He was providing  
19 the interpretation, the oversight of  
20 that modeling effort. And once it's  
21 calibrated, would that have been true  
22 for the calibrated model as well?  
23 Who did the --- who reviewed the  
24 calibrated model and --- once it's  
25 complete? You're looking at future

1 mining now.

2 A. Uh-huh (yes). Well, I think  
3 I'd say that Leo said that looks like  
4 a good model to use. We ought to go  
5 ahead and use that over in this other  
6 area.

7 Q. Okay. When the boundary  
8 element work was reviewed, what form  
9 did he look at? What actually is in  
10 front of him to review?

11 A. The output of the model,  
12 vertical stresses, vertical stress  
13 distribution, some convergence  
14 information.

15 Q. Was it in a digital form  
16 or ---?

17 A. Graphical form.

18 Q. Graphical form. Similar to  
19 what we see in the final reports?

20 A. Uh-huh (yes).

21 ATTORNEY WILLIAMS:

22 Was that a yes, sir?

23 A. Yes, that was a yes.

24 BY MR. ZELANKO:

25 Q. This is a pretty broad

1 question, but do you know what he  
2 looked for in the model results to  
3 draw conclusions from? What was he  
4 using as a gauge for the suitability  
5 of the design?

6 A. Well, I think we covered that  
7 in our report and said that it was  
8 all the stresses in the pillars or  
9 the convergence.

10 Q. And who wrote the letters to  
11 UEI when the work was finalized? The  
12 model has been run, it's been  
13 interpreted by, in this case, the  
14 principal. Who actually wrote the  
15 letter?

16 A. We're talking about which  
17 letter?

18 Q. Well, let's say the July 20th  
19 letter first.

20 A. July 20th, Leo would have  
21 written that.

22 Q. Who decided to do the ARMPS  
23 analysis in addition to LAMODEL?

24 A. I think there might have been  
25 a question from somebody, and that's

1        what triggered the --- presumably  
2        triggered the August 9th discussion  
3        of that, using the ARMPS alone.

4        Q. Was it a question from someone  
5        at Agapito or someone at Genwal  
6        or ---?

7        A. I think Genwal brought it up.

8        I think --- I can check and see if it  
9        is referenced. I honestly don't know  
10       the answer to that. I don't know. I  
11       don't know whether it came from  
12       either MSHA or --- I don't know, or  
13       if it came from Genwal direct.

14       Q. Okay. Let's talk about the  
15       LAMODEL input. What's Agapito's  
16       procedure for handling model files?  
17       How do you --- when you're running  
18       these calibration models, is there a  
19       procedure for keeping track of what's  
20       been done and how do you save the  
21       final runs? These things can be  
22       pretty large files.

23       A. I think we printed them all  
24       out and gave them to you.

25       Q. Okay. So everything ---?

1 A. It was quite a big stack of  
2 paper that was being delivered. It  
3 was the output of many, many runs,  
4 some of which are discarded, you  
5 know, calibration runs or runs that  
6 have an error in them and so they're  
7 discarded. I think you've got almost  
8 everything that we've recorded.

9 Q. Is there a procedure for  
10 handling them, or is it ---?

11 A. Well, we go around about  
12 whether or not we should save  
13 everything or what we should throw  
14 away. And we're going to throw away  
15 a lot more in the future, I mean,  
16 because we've got storage capacity  
17 constraints on this output. My  
18 policy is to keep the input files,  
19 which are much smaller. Sometimes if  
20 that's not done, Kim has to deal with  
21 keeping us --- enough memory space to  
22 keep everybody happy. So we are  
23 keeping a lot more than just the  
24 input files.

25 Q. Yeah. In a lot of cases it

1       seems if you keep the input files you  
2       can always rerun it if it's not a  
3       long model.

4       A. Yeah.

5       Q. You have provided us with  
6       everything that --- all the LAMODEL  
7       files that you have related to this  
8       project?

9       A. I believe so. All we've been  
10      able to find. Some of them get ---  
11      we have a process of archiving and  
12      storage, and then we also have  
13      storage on people's individual  
14      computers. So we were trying after a  
15      project was finished, to close out  
16      the project and transfer the files to  
17      an archive file, and that's then put  
18      into storage when it gets old enough.

19      But most of the time the files are  
20      still here and the documents are  
21      still here, and then we put out to  
22      remote storage.

23      ATTORNEY WILLIAMS:

24      I notice that ---.

25      ATTORNEY MENK:

1 I need to take a break

2 and talk to Kim.

3 ATTORNEY WILLIAMS:

4 Okay.

5 SHORT BREAK TAKEN

6 ATTORNEY MENK:

7 As best as I

8 understand, on the 226-20

9 project we gave you a CD that

10 has all of the digital files

11 on it. We did not separately

12 print out all of those digital

13 files. I think some of them

14 were printed out having to do

15 with some of the input ---

16 some of the input files were

17 printed out, but there are

18 currently these mesh files or

19 something. Each one of them is

20 hundreds of pages long. They

21 may show like overburden or

22 they may show the mine plan or

23 something like that. You

24 should have the digital files

25 for those but not printouts of

1 those.

2 MR. ZELANKO:

3 That's fine.

4 ATTORNEY MENK:

5 Then in that report

6 there were other reports

7 referred to. And I think we

8 have given you all of those

9 other reports, but I don't

10 believe we went back and

11 copied all of the background

12 documentation on the other

13 reports. You have the

14 reports, and I suppose if

15 there was some particular

16 background documentation

17 needed, if you could tell us,

18 we could figure out a way to

19 get that to you. But I think

20 the CD has got that.

21 MS. GREATHOUSE:

22 There's multiple CDs,

23 actually.

24 ATTORNEY MENK:

25 Multiple CDs.

1 MS. GREATHOUSE:

2 Yeah.

3 ATTORNEY MENK:

4 That's where all that

5 data would be.

6 MR. ZELANKO:

7 Well, I can certainly

8 understand why you wouldn't

9 want to print it out, because

10 it's not very useful in

11 printed form ---

12 MS. GREATHOUSE:

13 No.

14 MR. ZELANKO:

15 --- and it takes a lot

16 of paper to do that.

17 MS. GREATHOUSE:

18 No. The little pieces

19 don't show the big picture.

20 MR. ZELANKO:

21 Exactly.

22 ATTORNEY MENK:

23 So that's why we gave

24 you the digital files on that

25 one, so you ---.

1 MR. ZELANKO:

2 That's fine. In fact,

3 we'll get to that. We

4 recognize that that's a

5 difficult issue.

6 ATTORNEY MENK:

7 That's why there was

8 some confusion.

9 BY MR. ZELANKO:

10 Q. All right. I hate to go back,

11 but I need to ask you again just one

12 more question, a follow-up question

13 regarding ARMPS. Who actually ran

14 the ARMPS analysis that was done?

15 A. Leo.

16 Q. Do you know which version of

17 LAMODEL Agapito used for the Crandall

18 Canyon model?

19 A. No. I didn't use it myself.

20 I don't use them myself. You'll have

21 to ask Bo or Albert or Leo which

22 version he uses.

23 Q. But you can find out for us?

24 A. Yeah.

25 Q. Okay. Agapito has run models

1 to compare the results of EXPAREA and  
2 LAMODEL. Do you know how that  
3 comparison was made? Can you  
4 describe the work that was done?  
5 A. On other projects we've done  
6 some comparisons. There are some  
7 differences. LAMODEL has a laminated  
8 model. I can say there's another  
9 parameter in there in terms of pitch  
10 and behavior or thickness of the land  
11 map, and so you can tweak it a little  
12 bit more. We have used EXPAREA for  
13 20 years, 30 years, and so we've been  
14 comfortable with it. And we have  
15 done things that show that we can  
16 reproduce exactly the same answers  
17 with both. But that doesn't mean  
18 that if you used LAMODEL and put in  
19 different parameters you won't get  
20 something that we can't reproduce in  
21 EXPAREA, just because of the way that  
22 roof --- we had some trouble with  
23 behavior of the roof.  
24 Q. So that comparative work was  
25 done on a real project or was it done

1 on a representative filler model?

2 A. I think it was --- I mean, I  
3 can think of the most recent time it  
4 was done was with regard to another  
5 mine.

6 Q. Okay. Do you know if that one  
7 included a gob area?

8 A. Yes.

9 Q. And the results, how did they  
10 compare?

11 A. Very comparable.

12 Q. That might be an example where  
13 it would be useful for us to look at  
14 some input files from a previous  
15 project. Would it be possible for us  
16 to look at that comparison?

17 A. It's not a previous --- I  
18 don't know what was with regard to  
19 Crandall Canyon, but the one I was  
20 referring to was not done at Crandall  
21 Canyon. It was a different project,  
22 a different property.

23 Q. Right. But that's what I'm  
24 saying, that that's a case where it  
25 might be beneficial to look at input

1 properties.

2 ATTORNEY MENK:

3 We probably are going

4 to have some proprietary

5 problems with that.

6 MR. ZELANKO:

7 Okay.

8 A. With that particular example.

9 We could do an analysis on the

10 Crandall Canyon example to show you

11 that comparison, but that's not in

12 the record as far as I know.

13 BY MR. ZELANKO:

14 Q. Okay. The Crandall Canyon

15 LAMODEL work made use of such

16 material properties developed for

17 EXPAREA with some modifications; ---

18 A. Uh-huh (yes).

19 Q. --- is that correct? Okay.

20 Regarding the rock mass, you

21 indicated that the rock mass was

22 increased from one million in EXPAREA

23 to two million in LAMODEL. Why did

24 you use that number, two million?

25 A. You're into details that I'm

1 not familiar with.

2 Q. Okay. How did you confirm ---  
3 in your written response to us, how  
4 did you confirm that a two million  
5 PSI rock model was used? It's  
6 Question 47 (c)(1), page 9963.

7 ATTORNEY WILLIAMS:

8 In Exhibit One; right?

9 MR. ZELANKO:

10 Yeah.

11 A. (c)(1)?

12 BY MR. ZELANKO:

13 Q. Yes.

14 A. Well, I mean, that's all I  
15 know about that. In other words, I  
16 didn't participate in that, but  
17 that's not unusual. In that LAMODEL  
18 laminated model, there's a series of  
19 beams that are decoupled, and so it  
20 behaves more flexibly, if you like,  
21 than a solid roof which the EXPAREA  
22 has. So EXPAREA, one to two million,  
23 might be comparable with the  
24 thickness that was used for the  
25 laminate in the LAMODEL model.

1 ATTORNEY WILLIAMS:

2 Okay. Do you know

3 where that information came

4 from, that specific

5 information that was provided

6 there?

7 A. Who responded to that

8 question?

9 ATTORNEY WILLIAMS:

10 Right.

11 A. Bo Yu responded to that

12 question because he was the one that

13 did that, in cooperation with Leo.

14 BY MR. ZELANKO:

15 Q. Do you know if he looked at

16 text files or did he use a

17 preprocessor or did he refer to a

18 report?

19 A. For?

20 Q. To determine that two million

21 was what was used in the models. I'm

22 asking because we've looked at all

23 the input files that you gave us and

24 they all use three million, not two

25 million.

1 A. No. I'd have to ask you to  
2 look at --- and ask Bo if that's a  
3 typo or that's what he thought he  
4 used.

5 Q. Okay. Similarly, with respect  
6 to the gob, we've been unable to find  
7 any model that uses a strain  
8 hardening final modulus of 76,000.

9 Can you explain that? I think that's  
10 in the next --- very next answer  
11 there, where you're talking  
12 about ---.

13 A. Well, we checked that out.  
14 You're saying in the input files that  
15 you received, you have not seen these  
16 numbers used?

17 Q. The two million or 76,000, no.

18 A. Two million or 76,000. Okay.

19 MR. ZELANKO:

20 Do we have Exhibit ---?

21 BY MR. ZELANKO:

22 Q. Are you familiar with looking  
23 at input files?

24 A. No.

25 Q. No? When you were at the

1 University of Minnesota, they  
2 were --- were they developing MoLSA  
3 then?

4 A. Yes.

5 Q. This hasn't changed much from  
6 those days, if you're familiar with  
7 MoLSA.

8 ATTORNEY WILLIAMS:

9 This is Exhibit Four.

10 (Michael Hardy Exhibit  
11 4 marked for  
12 identification.)

13 BY MR. ZELANKO:

14 Q. These are some of the files  
15 that we received. And as Kimberly  
16 alluded to earlier, these files are  
17 huge, so the grid actually wraps  
18 around in the text file and makes it  
19 not easy to make sense of. So what  
20 we've done here is pulled them up in  
21 the notepad editor and just did a  
22 print screen. So what you're seeing  
23 at the top is the input parameters,  
24 and then below that is the grid. If  
25 I could just --- you're not familiar

1 with working with them, so can you  
2 tell us what the rock mass and final  
3 developed modulus would be just  
4 looking at those numbers?

5 A. This ratio, I think this is  
6 the last of the models. I'm not  
7 sure. I'm not sure what the second  
8 one is. This is 600.

9 Q. I think that's the thickness  
10 of the laminations, would be ---

11 A. Fifty (50).

12 Q. --- 50 feet; right? It's in  
13 inches.

14 A. Oh, inches, yeah.

15 Q. Yeah.

16 A. One, one and ten. I honestly  
17 don't know.

18 Q. You don't know. But I can  
19 tell you have some familiarity with  
20 looking at the numbers because those  
21 --- that's correct what you said. As  
22 I look through this, what I find is  
23 that Dave Conover, in that first one,  
24 used a gob modulus of 301,000 or  
25 thereabouts. The gob in that

1 material property list begins with  
2 the number five.

3 Let me back up on that. I  
4 think I misspoke. Let me get it in  
5 front of me, too. Yeah. Following  
6 all those lines that begin with  
7 three, the line with five, it's 100  
8 and then 301,000. That's one of the  
9 numbers that I've seen used. The  
10 other one is a 2180. Bo Yu and Hua  
11 Zhao appear to have used 2180 PSI.

12 A. Well, I'd have to --- this  
13 isn't --- well ---.

14 Q. That's fine. We can move on.

15 Let me just ask you, what's the  
16 effect of gob modulus in a boundary  
17 element model?

18 A. What is the what?

19 Q. Effect of gob modulus in the  
20 final ---.

21 A. What is the effect of it?

22 Q. Yeah.

23 A. Well, it's very important  
24 because it controls the load transfer  
25 through the gob. And you know, if

1       you have a bilinear model, there's a  
2       closure, and then you get contact and  
3       then you build up some load in the  
4       gob. And so there's various models  
5       used to do that. Some of them are  
6       just a straight line from zero  
7       convergence. Some of them are flat  
8       or bilinear. And it's --- we tweak  
9       that a lot to try and get the right  
10      load transfer through the gob. And  
11      this is a very important parameter.  
12      It's a very difficult parameter  
13      because we have very little feedback  
14      from the field that says this is the  
15      stress on the gob. It's the biggest  
16      --- quite possibly the biggest  
17      parameter that's used in interpreting  
18      load transfer from a gob into the  
19      barrier pillars and surrounding area.

20      Q. Okay. Do you know why the  
21      EXPAREA model used --- it was  
22      essentially a bilinear model with  
23      some closure and then, I think,  
24      67,000 PSI modulus. Do you know why,  
25      in this case, they used a strain

1 hardening model? They used,  
2 according to your written response, a  
3 100 PSI initial modulus and then  
4 76,000 PSI final modulus of some  
5 value. Do you know why they used  
6 strain hardening instead of bilinear?

7 A. I don't know. I don't know  
8 whether that's a peculiarity of  
9 LAMODEL, you know, that 100 is a  
10 fairly low number. It's almost like  
11 it's a bilinear.

12 Q. Right.

13 A. It's similar to EXPAREA's  
14 model.

15 Q. So do you know if the LAMODEL  
16 version that Agapito used had a  
17 bilinear ---?

18 A. No, I don't know.

19 Q. All right. Regarding coal  
20 properties, I'll give you another  
21 exhibit. Five here is the July 20th  
22 report to Genwal.

23 (Michael Hardy Exhibit

24 5 marked for  
25 identification.)

1 BY MR. ZELANKO:

2 Q. And in that report, I believe  
3 it's page --- Bates number 96 ---  
4 this is the July 20th report, Exhibit  
5 Five. On 96, the report discusses a  
6 method of slices to approximate the  
7 load-bearing capacity of pillars.

8 Can you describe that method?

9 A. Well, on that rib there's a  
10 zero confining pressure on the coal.

11 The strength is much weaker than in  
12 the interior of a pillar, where the  
13 coal is confined by horizontal  
14 stresses. And so this is the  
15 methodology that increases the  
16 strength of the coal as you go into  
17 the pillar.

18 I mean, as you all understand,  
19 these methods, it's not a precise  
20 model of every molecule of the coal  
21 in the rock. It's very much a  
22 simplified model. And if you do more  
23 complicated models you can determine  
24 what the horizontal stress is. This  
25 is an algorithm that we've developed

1       some time ago, I believe. And I  
2       don't know if this is the default  
3       value or a slightly-modified default  
4       value for LAMODEL, but it's really  
5       what Dave Conover has used a number  
6       of times and based on his use of  
7       LAMODEL over a longer period of time.

8       So that's the general basis of that  
9       equation.

10      Q. So Agapito used that equation,  
11      equation one, to determine the  
12      strengths of the slices; is that  
13      correct?

14      A. And progress in from the rib.  
15      Yeah, they took slices out.

16      Q. And the source of the equation  
17      is --- where did you get the  
18      equation?

19      A. I think --- I think this was  
20      the part of the work that Dave  
21      Conover did. And I'm not sure how  
22      well he referenced the source of it.  
23      In here, for example, it doesn't look  
24      like it's referenced other than these  
25      units, probably to LAMODEL itself.

1 That's just a general reference to  
2 LAMODEL. But I think Dave has used  
3 this model on a number of other  
4 occasions and is quite comfortable  
5 with that equation.

6 Q. It's quite similar to the one  
7 we use. It's just a little bit  
8 different.

9 Just to clarify a point here, in the  
10 key to that equation, S1 is shown as  
11 the in situ rock mass unconfined  
12 strength. Because we often refer to  
13 the rock mass in the model  
14 differently, does this, in this case,  
15 this rock mass refer to coal?

16 A. I think so. In that equation  
17 it's only for coal. It's not for the  
18 roof or the floor.

19 Q. The other three equations in  
20 there, do you know what the source of  
21 those are?

22 A. Well, the strain is equal to  
23 the stress divided by --- isn't that  
24 right?

25 Q. No. Well, yeah.

1 A. Let's look through this one,  
2 I'm not familiar with that one. What  
3 is that? That's the residual stress,  
4 which you're putting in this  
5 equation, this is the strength and  
6 this is the residual strength. And  
7 it's a very low value, generally.

8 Q. Okay. So those four  
9 equations, do they express the values  
10 that you need for a strain softening,  
11 stress strengthener?

12 A. Yes, correct.

13 Q. All right. The July 20th  
14 report discusses strengths for eight  
15 levels of increasing confinement  
16 based upon depth into the rib. And  
17 as you described, that refers to the  
18 method of slices; is that correct?

19 A. Yes.

20 Q. Are those the eight levels of  
21 confinement shown in table one of  
22 that report?

23 A. There is not --- and as I  
24 said, I didn't write this report, nor  
25 review it, so I'm presuming that

1       those numbers correspond to that  
2       equation.

3       Q. They do.

4       A. All right.

5       Q. I guess I'm asking to see if  
6       those are the strengths that  
7       correspond --- when he says there are  
8       eight levels of increasing  
9       confinement based upon depth, that  
10      table sort of summarizes those values  
11      from the equations?

12      A. Right.

13      Q. And can you describe, just  
14      going across there, what each of  
15      those rows mean? The first one is  
16      the depth into the rib?

17      A. Right. That's --- it ranges  
18      from 25 to 37 on this table. The  
19      first line would be the first element  
20      closest to the rib with minimum  
21      confining stress. So the confined  
22      strength is only 2,000 PSI. As you  
23      get into the pillar, it goes up to  
24      14,000, 15,000 PSI, with  
25      corresponding peak strength and

1 residual stress --- I mean residual  
2 strength. And it's gone up and came  
3 down, and then it's the flat part of  
4 that residual strength value.

5 Q. And so those last four  
6 columns, like you said, they define a  
7 strain softening stress strain curve?

8 A. Uh-huh (yes).

9 Q. And each set corresponds to  
10 the depth into the rib that's shown  
11 in the first column; is that correct?

12 A. Correct.

13 Q. Are these properties in table  
14 one the ones that Agapito used to  
15 model the Main West?

16 A. I believe so.

17 Q. Were these properties deployed  
18 in Agapito's models at the depths  
19 that are shown in the table?

20 A. I believe so. I've got to  
21 step back and say this would be  
22 applied to a five-foot element size,  
23 so this is the middle of that  
24 element. And so as we go forward, I  
25 would imagine it would tell us if we

1 did use the five-foot element.

2 Q. They did.

3 A. Okay.

4 Q. Let's switch gears a little  
5 bit. We'll let the modeling alone  
6 for just a minute.

7 A. Okay.

8 Q. You visited Crandall Canyon in  
9 December of 2006. Who initiated this  
10 visit? Why did you end up going to  
11 the mine in December?

12 A. Well, Laine called, and he  
13 often will call me as opposed to Leo.

14 I think in this case he called me  
15 and said, we would like to have you  
16 come out and verify what the  
17 conditions are as we are mining in  
18 this north barrier pillar from an  
19 engineer's perspective. And s at the  
20 time Leo was not available, and I  
21 went, and Bo Yu went, and we looked  
22 at the conditions. Bo had done the  
23 analysis on that, so he was most  
24 familiar with what we expected to  
25 see. Gary was --- he came along

1           because he had never been to the  
2           mine. He just wanted a look-see.  
3           And he was invited to another meeting  
4           later on that day. So he just kind  
5           of just came and looked. He was not  
6           involved in the analysis on this  
7           particular ---.

8           Q. And when you went underground,  
9           who did you travel with?

10          A. You know, I think we traveled  
11          with Laine, but we would have also --  
12          - sometimes somebody else was with  
13          us. I need to check to make sure.  
14          That was in December. It says here  
15          we were escorted by Laine.

16          Q. Okay.

17          A. And that's used --- often what  
18          happens, sometimes there's an  
19          entourage. In this case, it was  
20          Laine.

21          Q. And do you recall the areas  
22          that you visited and the conditions  
23          that you saw?

24          A. Well, we often --- you know,  
25          this is what we went to see, and

1       that's about all that was available  
2       for us to see. Because by this  
3       stage, the mine was pretty much  
4       closed down or, you know, we can't go  
5       anywhere else. So we walked, we came  
6       and drove in here and walked around  
7       up in here.

8       Q. And you're referring to a  
9       figure that shows the development of  
10      the north barrier section for a  
11      distance of --- does it say under  
12      what crosscut they had driven it to?

13     A. Crosscut 123.

14     Q. Okay. And can you describe  
15     the conditions?

16     A. Well, they are pretty --- what  
17     we'd call normal. Not very much rib  
18     sloughage. We were underestimating  
19     what the conditions were like from  
20     the remnant barrier pillar to the  
21     north side and the rib conditions  
22     along there. And we have a few  
23     photographs as of December 8th to  
24     illustrate that there wasn't much  
25     happening. We're at about 1,800,

1 almost 2,000 feet of cover. And the  
2 intent was, I believe, to get  
3 comfortable, as they proceeded  
4 forward under the --- up to 2,200  
5 feet, which was a few hundred feet  
6 further on. But the timing was such  
7 that it was visible back under 2,000  
8 --- 1,900 feet of cover. And things  
9 looked very good.

10 Now, I don't know whether  
11 there was a decision point by  
12 anybody, from management or  
13 negotiating with MSHA or whatever, I  
14 don't know, but he invited us to come  
15 up and look and see the modeling  
16 insofar as looking reasonable

17 Q. And in this Exhibit One, your  
18 written response, you said at one  
19 point, conditions were good, with  
20 roof, floor and rib conditions  
21 consistent with analytical  
22 predictions; is that correct?

23 A. Uh-huh (yes).

24 Q. Who reached that conclusion?

25 A. Me.

1 Q. And how? Did you compare what  
2 you'd seen with the LAMODEL results?  
3 A. In a very general sense. I  
4 mean, the most important thing about  
5 this was how much load was being  
6 transferred from here over to here.  
7 If there had been a significant cave  
8 event or a poor cave over here, we  
9 would have seen significant loading  
10 on this rib and the barrier pillar  
11 we're leaving behind. And the  
12 observations we made were nothing  
13 like what we had seen in place where  
14 there was 2,500 feet of cover or  
15 close to 3,000 feet of cover. So we  
16 were comfortable with the properties  
17 that had been selected for the gob  
18 were reasonable. We can't say that  
19 they were exactly accurate or not.  
20 But at least had we left this  
21 completely open, there was a lot of  
22 load transfer over here, this would  
23 have been under significant stress  
24 and rib sloughage and things we would  
25 have seen.

1 Q. So when you say it was  
2 consistent with the analytical  
3 predictions, you didn't go back and  
4 actually look at the model results  
5 and compare that just in a general  
6 sense?

7 A. Really, stress is a fictitious  
8 thing. You know, I can't go up and  
9 measure it and put a temperature  
10 gauge on it and measure it. So  
11 you're looking at what damage there  
12 is in the ribs, if there's any  
13 caverns, or popping of coal off the  
14 rib or sloughage off the ribs. It's  
15 essentially what we can see. And  
16 everything seemed to be, from a  
17 mining perspective, within the bounds  
18 of what they expected to see. There  
19 wasn't a lot of popping and bouncing  
20 and activity that they reported to  
21 us, because we weren't there while  
22 they were operating. It was a quiet  
23 day. I don't believe they were  
24 mining when we were there.

25 Q. Okay. Your second visit was

1 in March of 2007. Who initiated this  
2 visit?

3 A. Laine.

4 Q. And when did --- when was that  
5 --- did that come about? When did he  
6 call you?

7 A. Well, I think a day or so  
8 later. It wasn't --- we went out  
9 there I think four days after. It  
10 happened on Sunday and I think we  
11 were there on a Thursday. And so I  
12 think he called us on a Tuesday.

13 Q. And so you're saying they had  
14 an event, and that's what prompted  
15 him to call you and initiate the  
16 visit?

17 A. Yes.

18 Q. And so it was within days of  
19 when it occurred?

20 A. Yes.

21 Q. Okay. And what were you told  
22 when he called you? How did they  
23 describe the situation?

24 A. They had a bump or a burst ---  
25 not a burst. I don't know exactly

1 the words he used because I mix all  
2 those words up, and --- they were  
3 shut down. And so they wanted to  
4 look at it and see what we thought.

5 Q. Do you recall who you traveled  
6 with at that time?

7 A. Which one was that? Okay.

8 That day we went with Laine and Gary  
9 Peacock, yeah. He's the mine ---  
10 he's the mine manager at Genwal.

11 Q. I have a map here.

12 MR. ZELANKO:

13 Do we have it entered?

14 Oh, we'll use yours, yeah.

15 ATTORNEY WILLIAMS:

16 This is Exhibit Six.

17 (Michael Hardy Exhibit

18 6 marked for

19 identification.)

20 BY MR. ZELANKO:

21 Q. I have some markers. If I  
22 could ask you maybe to choose one to  
23 your liking. And I'd like to ask  
24 you, can you identify the areas that  
25 you visited and describe the

1 conditions that you observed then?

2 This is a map that you provided us  
3 that has notations on there. Maybe I  
4 could ask you first. Do you know who  
5 made the notes on there?

6 A. Yes.

7 Q. And who was that?

8 A. Leo.

9 Q. So just --- if you could share  
10 with us on that day the areas that  
11 you visited. And if you want to mark  
12 it in a color where you traveled, you  
13 physically traveled, if you can  
14 recall, it would be helpful.

15 A. In general, I don't really  
16 remember which entry we came in and  
17 where we parked and that sort of  
18 thing. But anyway, we did come ---  
19 approach this area here, up around  
20 here. I'm not sure how far we  
21 progressed down here.

22 Q. You're referring to Crosscut  
23 133, entries Two, Three and Four? I  
24 think they're numbered left to right.

25 A. I'm sure we came down here as

1 well.

2 Q. So you were down in the Number

3 One entry?

4 A. Number One entry. We came

5 around here and came down in here.

6 Q. That --- you went around the

7 newly-created gob between 134 and

8 135?

9 A. Went around it.

10 Q. Traveled down 136?

11 A. Yes, I believe we did that.

12 And we came around here. I mean,

13 it's essentially where there are

14 notes is where we were because we

15 made notes. We didn't make these up.

16 We came down out into here and saw

17 this. I'm not sure whether we came

18 on the back side here or just looked

19 at it from over there. These are

20 photographs --- you know, there's

21 notations here on every location that

22 we took a photograph.

23 Those photographs were taken

24 by Laine because we had forgotten our

25 camera. We normally take a camera.

1 And so we have these numbers on there  
2 of when they were taken. I don't  
3 know whether they correlate with the  
4 print, that we received ultimately  
5 from Laine. But on that day, we  
6 didn't end up with prints, we  
7 received photographs.

8 And also we came all the way  
9 down here. And I think there's  
10 somewhere an indication where water  
11 is. And we came down --- I don't  
12 know whether the water is there or  
13 was there or we saw the water up here  
14 a little closer, that notation there.

15 Q. Yeah. It's marked as edge of  
16 water.

17 A. Yeah. It was somewhere down  
18 here.

19 ATTORNEY WILLIAMS:

20 Define that area.

21 MR. ZELANKO:

22 We're discussing the  
23 bleeder. And Doctor Hardy has  
24 indicated he traveled in the  
25 bleeder entry Number Four down

1 to about 145 to within seeing

2 distance at least of the

3 water.

4 BY MR. ZELANKO:

5 Q. Is that accurate?

6 A. Right. And we made less

7 notations down here about the roof

8 conditions on this side. We made

9 more notations in here. I think we

10 took photographs down here. There's

11 a little bit of floor heave in this

12 area here.

13 Q. Could you indicate with a

14 marker where some of these things

15 are? Because I won't --- for the

16 record, I won't be able to tell.

17 A. You know, basically there's

18 nothing much that I can add that's

19 not on this drawing.

20 ATTORNEY WILLIAMS:

21 Is the floor heave

22 noted here?

23 A. The floor heave is marked

24 here, but this is something ---

25 there's a little bit of floor

1 movement. We might have a photograph  
2 of that, too, somewhere.

3 ATTORNEY WILLIAMS:

4 It probably would be  
5 helpful, if we can't read all  
6 that writing later, if you  
7 could mark with orange where  
8 the floor heave was?

9 ATTORNEY MENK:

10 We'll give you the  
11 translation of all that;  
12 right?

13 A. Yeah. Yeah. The floor  
14 heave ---.

15 ATTORNEY MENK:

16 In answer to question  
17 21.

18 A. There's a little bit of  
19 heaving in here. And I can't see  
20 another photo down here --- 22,  
21 there's a photo there, 22. It  
22 probably will show some floor heave.

23 We were able to look in through here  
24 to look at what was in there. Now we  
25 were told that they stopped doing

1       this because of --- primarily because  
2       of roof conditions, sagging of coal  
3       into the mesh and the bolts. And for  
4       whatever reason they stopped mining  
5       instead of mining in here.

6       BY MR. ZELANKO:

7       Q. So you were told that they  
8       stopped the retreat at about 137  
9       crosscut before they even got to the  
10      row between 137 and 138 because of  
11      roof conditions?

12      A. Roof conditions.

13      Q. And they moved back and  
14      started again?

15      A. Yes. And then the bursting  
16      that occurred was in and around here.  
17      And they were apparently mining into  
18      this panel, or that's the last thing  
19      that they did. They weren't mining  
20      into it when it occurred, when this  
21      burst occurred, because there's  
22      nobody on the mine at --- what is it?

23      At two o'clock or three o'clock in  
24      the morning when it burst. But it's  
25      hard to --- we couldn't tell whether

1       it burst there versus there. There's  
2       damage in this area and this was  
3       filling up with floor --- in around  
4       here, filling up with the floor  
5       heave. I don't believe anywhere that  
6       it was full to the roof, as it  
7       subsequently was over here in the  
8       south.

9       Q. Can I interrupt you just a  
10      minute? When you say here and here,  
11      for the record ---?

12      A. Let's say around the area of  
13      pillar 52, 49 and 51, there was a lot  
14      of rib sloughage around that area, as  
15      there was in the areas of pillars 41,  
16      44, 46, 43, and 45.

17      Q. And you couldn't differentiate  
18      between whether it bumped there ---

19      A. No.

20      Q. --- or there or perhaps both  
21      even?

22      A. Or both. Well, I mean there  
23      was damage in and around here, and  
24      there was a lot of damage in and  
25      around here.

1 Q. And how far out would you say  
2 the damage extended from the pillar  
3 that they were actively mining,  
4 pillar number 49 in that figure?

5 A. Well, I think --- I would look  
6 at photographs one, two and three,  
7 which were the first photos we took,  
8 and see what the condition of this  
9 is. But Leo had not indicated much  
10 sloughage around here. There may be  
11 some sloughage there. You would see  
12 a bigger --- bigger blocks. That  
13 probably refers to the rib --- the  
14 larger blocks of rib falling out  
15 there. His photos four and five,  
16 between pillars 51 and 53, which  
17 would display the conditions in that  
18 area.

19 Q. I guess I'm interested in ---  
20 you had said in the bleeder entry,  
21 Number One there weren't many  
22 notations between 144 and 140. And  
23 was that --- there wasn't any damage  
24 there or there just aren't many  
25 notations there?

1       A. I think it was less damage  
2       along here, but I really ---. Let me  
3       see. It says something heave one to  
4       two feet. And over here it says  
5       heave, nothing on it. And then  
6       there's a bad roof causing need to  
7       move --- one foot of top coal, bad  
8       roof, causing need to move one foot  
9       of top coal in bagging in this  
10      particular crosscut here, 29 --- 144.  
11      And there's some bagging in the roof  
12      up here. And there's a photo 23 down  
13      there, if you look at that, in that  
14      area.

15      But I believe it wasn't so  
16      bad. I mean, even the rib wasn't so  
17      bad, particularly with a lot of  
18      activity that happened down here. It  
19      happened in here and around here.

20      Q. Okay. But to your knowledge,  
21      did extend --- the damage did extent  
22      outby the current face of 133 for  
23      some distance?

24      A. Yes. I mean, it was in and  
25      around here, there was damage.

1 Q. Okay.

2 A. Why I'm hesitant on this, is  
3 that we didn't get these photos ---  
4 in fact, I've only looked at them  
5 once since the time I was there. And  
6 I presume we have them in our file  
7 somewhere. We did not get, you know,  
8 a digital version of them, we got, I  
9 believe, a printout of it. They were  
10 not very well annotated, as I recall,  
11 although --- so anyway, I haven't  
12 been refreshing my memory about this  
13 recently.

14 Q. That's fine. We actually have  
15 this drawing with the figures with  
16 the photos showing you each one of  
17 them, but we don't need to do that, I  
18 don't think, right now at least.

19 Okay. You said you do recall,  
20 though, that you were down in the  
21 Number One entry?

22 A. I'm pretty sure we were there.  
23 It doesn't look like we took any  
24 photos down there. We were keeping  
25 track of, you know, the gas, but I

1 don't believe we ever saw any  
2 significant gas down there. We  
3 probably didn't take any photos down  
4 there. So the three of us were down  
5 there, and Leo was taking  
6 photographs. And sometimes we would  
7 say, hey, make sure you get a photo  
8 of this and this. And sometimes he  
9 was taking photographs that he  
10 thought were important. So it's kind  
11 of a --- well, no, he was taking ---  
12 I think Laine might have given him  
13 the camera, and Leo took the pictures  
14 and Laine kept the camera.

15 Q. And you said Leo wrote these  
16 notes?

17 A. Yes.

18 Q. Is mapping something Agapito  
19 typically does during underground  
20 visits?

21 A. It varies. I mean, this is  
22 much more than we normally do.  
23 Normally, we will keep a record of  
24 what we went through here and around  
25 there. In a write-up you will often

1 see a map that says we went to these  
2 areas. This one we didn't trace the  
3 exact --- I don't believe we did,  
4 the exact path we followed because we  
5 were in and out and up and down and  
6 all over.

7 Q. What prompted you to do this  
8 type of note taking here?

9 A. Well, because this was an  
10 event where, fortunately, nobody was  
11 injured, but it was --- the question  
12 was what can you do from here on. It  
13 would be nice if we could fully  
14 understand what was happening there.

15 There might have been a possibility  
16 that they would continue to mine here  
17 or cut off here and go down here. Or  
18 of course there was this on the table  
19 and they wanted to know should we do  
20 something different here or what  
21 should we do down there?

22 ATTORNEY WILLIAMS:

23 Here being the south  
24 barrier?

25 A. The south barrier.

1 BY MR. ZELANKO:

2 Q. Okay. You indicated in a  
3 written response to us that the ---  
4 some of those markings, the ones on  
5 the rib lines that --- for example,  
6 circle number 44 in this figure,  
7 indicated the approximate depth of  
8 rib sloughage. How would you  
9 characterize that sloughage?

10 A. Well, it was --- it had broken  
11 into small pieces and filled up ---  
12 not filled up a room, but filled up  
13 to say two or three feet, you know,  
14 in the --- it was still open. Two or  
15 three feet had been closed. It sort  
16 of half filled the room in some  
17 places. But it was smaller, it  
18 wasn't a big collapse. And that's  
19 why I'm sure Leo wrote down  
20 something, hey, those were bigger  
21 slabs, maybe indicating that there  
22 was more energy released over in this  
23 area ---.

24 Q. But did it all appear to be  
25 bumped coal?

1 A. Yeah, most of it. I mean,  
2 maybe down here not so because there  
3 wasn't --- you know, there wasn't  
4 much ---. I don't believe there was  
5 much coal, rib sloughage, down here.  
6 We had a little bit here and here,  
7 but down here, we didn't note it down  
8 there.

9 ATTORNEY WILLIAMS:

10 Inby in the bleeder?

11 A. Inby the bleeder, yeah.

12 BY MR. ZELANKO:

13 Q. So it looked like maybe the  
14 bumped coal was more between --- I  
15 think you were pointing to 138 to  
16 140, somewhere in that range, as  
17 opposed to further inby 140?

18 A. Yes. In here and here.

19 Q. I'm particularly interested in  
20 the rib conditions back here just  
21 outby the face area in 133.

22 A. Okay.

23 Q. Was it fairly consistent, do  
24 you recall, as you went left to right  
25 from entry One to Four in those

1 entries --- say in 133 or 132, was it  
2 fairly consistent across there or was  
3 it worse in one area than another?

4 A. I don't remember. I mean,  
5 there was lots of coal on the floor  
6 in all these places. I think we  
7 moved --- it came in here ---.

8 Q. Here being Number Two entry,  
9 between 133 and 134. And you say all  
10 those headings inby 133 had --- they  
11 were pretty full?

12 A. They were full of coal. I  
13 think these ones all the way through.  
14 Now, this one indicates, you know,  
15 sloughage on this side here. But I  
16 don't know why there's no notation on  
17 this side and this side. I think we  
18 got into here, which is a fairly  
19 dangerous place to be.

20 Q. Were the mobile roof supports  
21 still in there or were they pulled  
22 out of there?

23 A. They had been pulled out.

24 Q. Okay.

25 Q. Unless there was --- no, maybe

1       that's one there and then maybe one  
2       over there, I think.

3       Q. So you did get in to look ---

4       A. Yes.

5       Q. --- in those areas around the  
6       mobile roof supports?

7       A. And that's photo 12. So you  
8       could verify that when you look at  
9       the photo.

10      Q. But as far as left, right,  
11      across the section, further outby, do  
12      you have any recollection of what the  
13      conditions --- how they might have  
14      varied across the section?

15      A. Well, if you go down here, and  
16      here, and here --- on the photographs  
17      of this area, and this area, so you  
18      can verify what it looks like. I  
19      don't know what that is there.

20      That's between 56 and 55. But the  
21      bigger blocks here --- I think it was  
22      easier to walk in here, for sure, but  
23      the bigger blocks indicate a little  
24      better character than what was in  
25      this area.

1 Q. Okay. I'm also interested in  
2 the condition between 136 and 137.  
3 Can you speak to that? What was the  
4 condition of those particular  
5 pillars?

6 A. These?

7 Q. Yeah. The solid pillars were  
8 left sort of between the two gob  
9 areas.

10 A. Well, I don't think we can get  
11 much further than this point here  
12 because there was so much material  
13 around. You can see that Leo is  
14 indicating they've taken some part of  
15 this out.

16 Q. Right.

17 A. And I don't know what the  
18 conditions were here, they probably  
19 mined that out as well.

20 Q. You're referring to the cuts  
21 that they took out of block number  
22 41?

23 A. Forty-one (41). But at least  
24 the way they drew this they didn't  
25 think there was anything there. So

1       there may have only been a roof ---  
2       well, Leo drew it as though there was  
3       a good half a pillar there.  And I  
4       think that's --- I mean, it's a  
5       reasonable representation.

6       The difference --- I guess we  
7       couldn't really tell what's on the  
8       back side of 46 and on the back side  
9       of 45.  Number 44, there's an  
10      indication that it's fully surrounded  
11      by rib sloughage.  Forty-six (46) is  
12      pretty competent.  And I can't tell  
13      you, without going back and looking  
14      at the photographs, really what was  
15      the difference between, say, 44 and  
16      46.

17      Q.  Well, just as you recall, were  
18      43 and 44 as heavily damaged, as you  
19      remember, as 45 and 46 or 42?  Were  
20      they all in a similar condition?

21      A.  I'm not sure --- you know, I  
22      mean, we got --- I think we got ---  
23      well, we got into here and looked in  
24      this direction and that direction.  I  
25      don't think we got down here and

1 looked. Otherwise, we would have had

2 a little bit more notation over here.

3 Q. Yeah.

4 A. But I don't know.

5 Q. Okay.

6 A. It might have been that we

7 were, you know, limited in the places

8 we could access in and around here.

9 Q. And if you were limited, it

10 probably meant, what, too much coal

11 in the ---?

12 A. Probably too much coal or the

13 roof might have looked a little bad.

14 Q. Okay. All right. After that

15 visit, additional boundary element

16 models were run. After your first

17 visit, you said your observations

18 were consistent with the analytical

19 models. Did you again make

20 comparisons between the LAMODEL

21 results and these underground

22 observations?

23 A. We did some analysis of this

24 configuration.

25 Q. Right.

1       A. And we showed some very high  
2       stresses in some of these things, in  
3       the coal remaining in here. And I  
4       don't think we modeled this by taking  
5       this material out and taking these  
6       guys down. We modeled it the same  
7       way as we had done before, with the  
8       reduction of strength as you go in  
9       from the outside.

10      Our biggest focus was on what  
11      to do down here. We really didn't  
12      look at the conditions of other  
13      mining options in and around here,  
14      whether they --- whether MSHA or they  
15      decided that this was a lost cause,  
16      I'm not sure what it is. But we  
17      looked at this, and kind of honestly  
18      we looked at there's two ways to do  
19      this, make this smaller or make it  
20      bigger. Making them smaller might  
21      mean that you're in a more yielding  
22      mode, and not as much energy  
23      contained in the pillars. So there  
24      was a real possibility that making  
25      them smaller might have worked

1 better. And then recovery,  
2 retreating out of there, we'd be  
3 mining into essentially thinner  
4 pillars and softer pillars. Or the  
5 other alternative is to make them  
6 bigger. We didn't really look very  
7 hard at making them smaller from more  
8 psychological reasons rather than  
9 technical reasons.

10 Q. With regard to the numerical  
11 modeling that was done afterwards, it  
12 did include, though --- it did model  
13 this area, as well as the mining in  
14 the south; is that correct?

15 A. Uh-huh (yes). That's a yes.

16 Q. When those models were run,  
17 did anyone go back and look at that  
18 model output, either your convergence  
19 data, amount of yielding or vertical  
20 stress, and make a direct comparison  
21 to what you observed underground?

22 A. No.

23 Q. No? In your written response  
24 you indicated --- you make reference  
25 to a March 12th bounce. Is that date

1 accurate or ---?

2 A. I don't know. Let me look.

3 This is April 12th, 18th?

4 Q. In your written response to  
5 us, it's on page 9954, the Bates  
6 stamp number, Exhibit One. It's just  
7 the date conflicts with some  
8 information that we have.

9 A. Yeah. Right. I would have to  
10 --- what day is the 14th? Does  
11 anybody know? Is it a Tuesday, a  
12 Wednesday or something like that? I  
13 thought I checked my calendar and  
14 things when I wrote that down. And  
15 it's got there, that on page eight  
16 that the bump occurred on March 12th.

17 So no, we didn't --- you know, we  
18 got at that pretty quick.

19 ATTORNEY MENK:

20 Is this 2007?

21 A. Yeah. The 12th is a Monday,  
22 so it actually happened on a Sunday  
23 night. No, it happened early Monday  
24 morning, I believe. Yeah. And I  
25 think it --- was it recorded on the

1 13th or 14th of April? I don't know.

2 What day was that? We went out

3 there on ---. This says March.

4 ATTORNEY MENK:

5 Well, the answer says

6 the 16th.

7 A. Yeah. The answer says we went

8 out --- we got a call on the 14th.

9 And we went out there on the 16th, it  
10 was when --- it was within that week.

11 Q. Okay. Is this about when you  
12 became more personally involved in  
13 the project?

14 A. Well, some, but not --- I  
15 still didn't do the analysis. Leo  
16 was still involved. Leo and Bo did  
17 the analysis and I looked at the  
18 report and compared it with the  
19 report.

20 Q. Let's see. In that same  
21 Exhibit One, on page 9953, your mine  
22 visits indicated to you that Genwal  
23 implemented a plan analyzed by  
24 Agapito, with the exception of  
25 leaving some pillars. We asked you,

1 did you notice --- was the company  
2 complying with --- or not complying  
3 with, were they implementing your  
4 design as you intended?

5 A. Are you talking about the  
6 south barrier or the north ---?

7 Q. We indicated for the north,  
8 initially. And it leads to the  
9 question, when did you first advise  
10 Genwal not to leave pillars?

11 A. Well, only when we came out  
12 here there was a possibility that  
13 that had caused something to occur  
14 over here. And left this to get a  
15 little bit extra load on it and  
16 caused this to go bang.

17 Q. We're talking about the  
18 retreat on the north barrier section,  
19 that when they mined back to 138 and  
20 then skipped and started mining  
21 again, that skipping the blocks may  
22 have had an influence?

23 A. It may have had an influence.

24 I'm not sure that we can prove that  
25 in any analytical way because ---

1 but in other circumstances when you  
2 got a wider panel and you're doing  
3 this, this is a bad thing to do, you  
4 load this thing up. But this is not  
5 a very big span here and --- you  
6 know, and I'm not sure we can really  
7 prove that. Just that it did not ---  
8 had they asked us before, we would  
9 have said don't do that. Mine  
10 through the problems you're having  
11 with the roof control and just keep  
12 pulling it back out. That's what we  
13 would have recommended. That's what  
14 we recommended, too, I believe.

15 Q. Had they asked, you would have  
16 done that, but you didn't recommend  
17 it before that?

18 A. No.

19 Q. Okay.

20 A. They told us they're going to  
21 retreat out, and that's what you  
22 normally do is you retreat out. You  
23 don't do things like this, unless  
24 you've got some ---.

25 ATTORNEY WILLIAMS:

1 Meaning leave pillars?

2 A. Yeah, leave pillars.

3 BY MR. ZELANKO:

4 Q. Okay. And can you --- I think  
5 you addressed it at least in part,  
6 but can you elaborate a little bit on  
7 why it's important not to skip  
8 blocks?

9 A. Well, if I leave a block in  
10 here and mine this out here, I'm  
11 going to --- this is going to focus a  
12 lot of load into these pillars. And  
13 there could be a violent event that  
14 occurs where these fly out and cause  
15 some extra loading on the areas where  
16 the guys are working. Failure in  
17 there, per se, when we're working  
18 down here is not an issue or not a  
19 problem unless there was an air blast  
20 and it causes major damage all the  
21 way out. But essentially, you just  
22 don't want to leave that out there.  
23 Even one pillar, it can go bang and  
24 cause the roof to fall over here and  
25 cause this retreating event.

1 Q. That's something I wanted to  
2 ask you earlier. When you were in  
3 some of these areas after the March  
4 bump or bounce and you looked into  
5 the gob, what was the nature of the  
6 caving that you observed in the  
7 pillars that were being mined?

8 A. There was some caving, but I  
9 wouldn't say it was --- we don't have  
10 evidence that it was complete caving.

11 We can see some openings through  
12 back here, from here. I don't know  
13 how --- you had to go through some  
14 form of a stopping in through here.  
15 And I think we both did those. Maybe  
16 it was here. Okay. So we got some  
17 stumps in there, so it wasn't caved  
18 in through here.

19 Q. This is at 141, you were able  
20 to look through a door or something  
21 just to get an idea of the caving?

22 A. Yes.

23 Q. And it didn't look very  
24 complete?

25 A. No. Can I take a break?

1 MR. ZELANKO:

2 Certainly. I'm ready,

3 too.

4 SHORT BREAK TAKEN

5 BY MR. ZELANKO:

6 Q. You just described why they

7 should avoid skipping blocks. But I

8 wanted to go back and, first of all,

9 refer to this map again, which is

10 Exhibit ---

11 ATTORNEY MENK:

12 Six.

13 BY MR. ZELANKO:

14 Q. Six. Right under your book

15 there there's a sketch of a longer

16 pillar. What's the nature of

17 that --- were those things discussed

18 during this visit? What does that

19 indicate?

20 A. I think you'd have to ask Leo.

21 I don't recall having a conversation

22 while these things were written on

23 this. No, I don't.

24 Q. Okay.

25 A. Unless Leo brought it back to

1 the office and talked to somebody

2 later on, I do not know.

3 Q. That may not have been

4 concurrent with the visit then. It

5 could have been something later on.

6 Okay. And you said that after this

7 visit in March there were additional

8 models developed and run to look at

9 various potential configurations to

10 be used in the south; is that

11 correct?

12 A. Yes.

13 Q. And I asked you about the work

14 that was done. It included some of -

15 -- an area up here of the March bump.

16 And I asked, were comparisons made

17 between the LAMODEL results and your

18 underground observations. I'm not

19 sure if that's --- if you made those

20 comparisons or did I ask if anyone

21 else might have made those

22 comparisons?

23 A. Well, we modeled it. And I

24 think --- I don't think we went

25 extensively into modeling. It's sort

1 of like one or a few runs. It wasn't  
2 like we did a lot of calibration or  
3 modification of geometry or that sort  
4 of thing. It was one model, and that  
5 was reproduced in our report.

6 Q. Do you know who did that  
7 model?

8 A. Bo did the model under the  
9 direction of Leo.

10 Q. And who would have done --- we  
11 established earlier that the models  
12 are run and then someone else looks  
13 at it. Who would have looked at those  
14 results?

15 A. Well, Leo would have looked at  
16 them as they were coming out.  
17 Eventually I looked at them as well.

18 Q. And what did you draw from  
19 those models? What conclusions did  
20 you draw?

21 A. You know, there were some high  
22 stresses in this area at some of  
23 these pillars. And I don't think we  
24 concluded --- we didn't go through  
25 the model saying this failed, and

1        what would have happened if this  
2        failed, this failed, and this failed.  
3        We didn't do a very extensive  
4        sequence of events or change of  
5        properties. So we really --- when a  
6        thing fails like this, if it failed  
7        all the way through, which is  
8        possible, but we don't know from  
9        where we sit whether it did or  
10       didn't, or what the load-carrying  
11       capacity of this was. I remember  
12       someone commenting that, the stresses  
13       in here, in that model looked very  
14       high, which could have been the  
15       conditions prior to the collapse.  
16       But we didn't look at the condition  
17       after the collapse.  
18       Q. Okay. All right. We'll go  
19       back to skipping blocks. You  
20       described why you should avoid  
21       skipping blocks. In the April 18th  
22       letter, I believe we have it here as  
23       Exhibit Seven, you said skipping  
24       pillars should be avoided in the  
25       south barrier, particularly under the

1 deepest cover. I think that's on the  
2 page marked 215. And the question  
3 is, what does under the deepest cover  
4 mean?

5 (Michael Hardy Exhibit  
6 7 marked for  
7 identification.)

8 A. Well, we don't have the depth  
9 of cover on this particular map. But  
10 here we have a ridge of 2,200 feet of  
11 cover. It's not very extensive, but  
12 it --- I would say, reading between  
13 the lines, it's sort of between the  
14 2,000, 2,200 range. Or, I mean,  
15 honestly, this was at 1,800 feet ---  
16 1,800 to 1,900 feet. So it might  
17 have been even broader than that.  
18 But in this paragraph, I guess it is  
19 not defined.

20 BY MR. ZELANKO:

21 Q. Was Agapito ever asked to  
22 clarify that statement for the  
23 operator?

24 A. No.

25 Q. Okay. In an earlier draft of

1 the July 20th report, Table One  
2 included an additional column, and I  
3 happen to have the draft here. We'll  
4 mark it Exhibit Eight.

5 (Michael Hardy Exhibit  
6 8 marked for  
7 identification.)

8 BY MR. ZELANKO:

9 Q. This is a draft of the July  
10 20th report that you provided to us.

11 And you can see there in Table One  
12 there's a separate column at the  
13 beginning. Do those letters  
14 correspond to material properties?

15 A. I don't know whether you  
16 designate these by these letters and  
17 this is the strength. I don't know  
18 personally.

19 Q. Okay. Are you familiar with  
20 how letters were used in the boundary  
21 element grid?

22 A. No.

23 Q. Okay. If we look at --- we  
24 gave you Exhibit Four, which was some  
25 of the files --- input file printouts

1 that you provided to us. If we look  
2 at page --- the fourth page, it says  
3 at the bottom, Bo Yu modeling file,  
4 7/20/06. In that bottom portion of  
5 that file, there's a series of  
6 numbers and letters, ones and the  
7 letters A through I. Does that  
8 appear to represent a model grid?

9 A. Yes.

10 Q. And in --- the ones, do they  
11 appear to represent entries?

12 A. Well, I mean, I --- it looks  
13 like they're entries. The ones have  
14 been mined-out rooms. And these  
15 letters would correspond to portions  
16 of pillars. But I don't know.

17 Q. And the fact that there's five  
18 ones there looks to me like that  
19 confirms that it's a five-foot grid.  
20 So if we have five-foot grids, I look  
21 at four ones, that means the entries  
22 would be 20 feet.

23 A. Right.

24 Q. And as I look at this table up  
25 here, I see material properties.

1       There are ten material properties up  
2       there, the one and then there's, I  
3       think, nine --- or eight lines that  
4       begin with the letter two. And those  
5       numbers in there correspond with the  
6       numbers in Table One of that other  
7       document that we gave you, number  
8       eight.

9       If you'd just take a quick  
10       look at that. I know you said  
11       earlier you weren't familiar with  
12       looking at these files, but let's see  
13       if you can just confirm.

14       A. That would be the last of  
15       those pillars; right?

16       Q. That's what I would say, yes.  
17       And the first --- the row below that,  
18       14,560, appears to correspond to the  
19       letter B in the table; is that  
20       correct?

21       A. Yeah.

22       Q. Okay. And in the table, B  
23       would be at what distance?

24       A. Thirty-seven (37) and a half  
25       feet.

1 Q. Thirty-seven (37) and a half  
2 feet. Now, if we look at this grid  
3 of Bo Yu's and we count how many  
4 elements it is from the ---.

5 A. It's four.

6 Q. It's four, which would  
7 correspond to ---

8 A. Twenty (20) feet.

9 Q. --- 20 feet. Can you explain  
10 the difference there?

11 A. No.

12 Q. And similarly, in the pillars,  
13 I see B lies four elements away. And  
14 the core of the pillar then becomes  
15 the letter A, which I believe is  
16 elastic; is that correct?

17 A. Yes.

18 Q. So it appears to me that these  
19 elements, the properties, aren't  
20 consistent with the depths in Table  
21 One. Can you explain that?

22 A. No.

23 Q. Okay. Do you know --- when  
24 these files are reviewed, do you know  
25 how they're reviewed? Do people

1 typically look at these, the raw  
2 input files, or they use a  
3 preprocessor?

4 A. I don't know. You'd have to  
5 ask Bo or Leo.

6 Q. Bo or Leo would know --- they  
7 would be able to tell us more about  
8 this distribution?

9 A. I mean, I can get back to you  
10 on this. They might have gone  
11 through a calibration that they  
12 decided that they wanted a gradation  
13 that was more steeply than this. I  
14 don't know. It doesn't look to me  
15 like it's mentioned in the report.

16 Q. Okay. If we refer back to  
17 Figure five --- or Exhibit Five, if  
18 we look at Figure 15, I think it's  
19 Bates page 116, at the bottom of that  
20 page there is some --- there's an  
21 indication there that those pillars  
22 are 70 by 72. What's the yield  
23 condition in the middle of those  
24 pillars?

25 A. These ones down here?

1 Q. Yeah.

2 A. I think they're elastic ---  
3 the middle barriers are elastic.

4 Q. Okay. What would you say the  
5 width of the --- the approximate  
6 width of the yield zone is, just  
7 relative to the entry width?

8 A. Twenty-seven (27) feet.

9 Q. So that seems to be consistent  
10 with what we're seeing here in these  
11 input files, that the distance ---  
12 that the yield zone is 20 feet as  
13 opposed to the distance that's  
14 indicated in Table One.

15 A. Right.

16 Q. What would the depth be based  
17 on Table One? The core, I think, of  
18 I was 37-and-a-half feet; correct?

19 A. Was that the last one? I was  
20 --- B was 37-and-a-half feet.

21 Q. Okay. Yeah.

22 A. Yeah.

23 Q. So it's about half of what  
24 Table One indicates. Okay.

25 A. You know, I'm not sure what

1       they did, but what they --- at least  
2       in the calibrations they did early  
3       on, they found --- they used some  
4       numbers, as I mentioned earlier.  
5       They would get a complete feel for  
6       all the pillars --- all the pillars  
7       out here, you know, in the mains.  
8       And the way which they calibrated  
9       this is the mining, retreat mining in  
10      that north section. And we have  
11      other evidence about a yielding into  
12      pillars and into ribs. It's not  
13      being really as extensive as what you  
14      saw on that table, 37 feet.

15      Q. And what was the basis for  
16      that?

17      A. Observations, just physical  
18      observations of edge lines and around  
19      ribs and pillars. Now, I'm  
20      speculating, so I wouldn't say that's  
21      the reason, but I would ask Leo and  
22      Bo to respond to that question.

23      Q. In your written response to  
24      us, you used the term mature cave.  
25      Can you explain that term?

1 A. You mean --- referring to up

2 here now?

3 Q. Yeah. And in panel 12 or

4 panel 13.

5 A. Yeah. Mature cave --- first

6 of all, these panels were mined in

7 '99, this panel to the immediate

8 north, panel 12, and it's the end of

9 a number of series of panels to the

10 north. Good caving is exhibited

11 physically in mining in these panels.

12 And we were concerned at one time

13 that there was no evidence of

14 subsidence above here, which was

15 possibly misleading evidence. This

16 is when they first started these

17 caves. And so subsequently they

18 verified that there was subsidence

19 above them.

20 So we were working on the

21 assumption that there was good cave

22 here. As subsequently evidenced,

23 down here there was a better

24 subsidence record kept down in the

25 southern part. But we don't have

1 very good records up there, I  
2 believe, in terms of subsidence  
3 records above there. There were some  
4 miscellaneous points that were  
5 recorded in some aerial survey type  
6 of work that was done, but all  
7 indications where this had caved  
8 well.

9 A good cave is when there is a  
10 load transfer between the gob and the  
11 roof. In other words, initially,  
12 when you mined it out, they were  
13 taking coal out, there's no stress on  
14 the roof. Collapse occurs and it  
15 compacts it a little. And there's  
16 load transfer. It maybe isn't as  
17 high as the pre-existing stress, the  
18 vertical stress.

19 Q. Okay. I was going to ask you,  
20 what are the effects of a mature cave  
21 on abutment stress transfer and gob  
22 loading, but I think you just  
23 answered that, at least in part. Gob  
24 loading, you said it could be back to  
25 near in situ vertical stress?

1 A. Yes.

2 Q. What's the implication on  
3 abutment stress transfer then?

4 A. Well, let's say that out here  
5 there was good load transfer. You  
6 transition back to here and there  
7 might still be some open space here.  
8 It may not have collapsed completely,  
9 and there may be some load transfer  
10 across a local area here into this  
11 barrier pillar. Initially, that's  
12 what we were concerned about is how  
13 big this should be to compensate for  
14 any load that's coming across from  
15 here.

16 As you know, there are many  
17 places that are mined closer than  
18 this to old gobs, with old gobs that  
19 have collapsed completely. In some  
20 places, you can mine right up  
21 adjacent to them. I think the  
22 evidence that they had from down in  
23 the southern part, that they did  
24 successfully mine up fairly close to  
25 these old gobs.

1 Q. So the experience that they  
2 had in the south mains influenced  
3 your thinking up here as well?

4 A. Well, you know, I wasn't  
5 involved in those conversations at  
6 the time, but that was the experience  
7 that they had. They had mined this  
8 up --- the barriers in the south and  
9 that they had good experience there.

10 We didn't visit that site for the  
11 operation, though. So it's hearsay.

12 Q. Can we take a look at Figure  
13 20 on page 121 of that Exhibit Five?

14 A. 120?

15 Q. Yes, sir.

16 ATTORNEY WILLIAMS:

17 Page 121.

18 A. This one?

19 BY MR. ZELANKO:

20 Q. Yeah. As we look at that, you  
21 can see the panel 12 layer gob. What  
22 would you say is the typical gob  
23 stress there?

24 A. Not very much. Less than  
25 1,000.

1 Q. Are those consistent with the  
2 term you used, mature gob?

3 A. Not really. But when you're  
4 doing the model, maybe they --- this  
5 is one case. I don't know about the  
6 last case, but this is showing a high  
7 stress concentration in the rim of  
8 the barrier pillar. But it's still a  
9 fairly sharp decline in the stress in  
10 the barrier pillar. So that by the  
11 time you get out into this proposed  
12 mine plan, there is not much load  
13 transfer across there. It's been  
14 generally resisted by this room-and-  
15 pillar --- this pillar here.

16 And that's a conservative  
17 position to take. In an analysis, it  
18 is not to put all the load transfer  
19 through there. I have some excessive  
20 amount coming over here, so we've got  
21 some protection. Now, it could well  
22 be that it's much less than this,  
23 along this barrier here, along this  
24 side of the remnant barrier pillar as  
25 the north side. That would be

1 indicated by this. That's 30,000

2 PSI.

3 Q. Well, yeah. The peak abutment

4 stress area you said was about 30,000

5 PSI. If you look at Figure 14 in

6 that same exhibit, that's page 115 --

7 - page 115, and if you just hold 20

8 open there, too. Is Figure 20 a

9 cross-section through Figure 14?

10 A. Figure 20. Okay. Number 14

11 is AA. That's it. Down here.

12 Q. It actually looks like it

13 extends a little farther than what

14 the AA segment shows ---

15 A. This is ---.

16 Q. --- but do you agree it's a

17 cross-section through Figure 14?

18 A. Well, that's what it says.

19 But I mean there's modeling here that

20 shows proposed mine planning going

21 through there. So this line here is

22 the line prior to mining, I presume

23 like that.

24 Q. On that Figure 14, then what's

25 the highest range in the scale?

1 A. 10,000.

2 Q. 10,000. And that's colored

3 red?

4 A. Yeah.

5 Q. Doesn't that really indicate  
6 between 9,000 and 10,000 is red?

7 A. Well, I imagine it says  
8 anything above 9,000 is red.

9 Q. Okay. So anything above  
10 9,000?

11 A. Yeah.

12 Q. So from that figure it's  
13 difficult to tell what the peak  
14 stresses are?

15 A. Right.

16 Q. And what's the lowest range?

17 A. 1,000.

18 Q. So zero to 1,000. And then  
19 that actually defines then the  
20 accuracy that you can tell from the  
21 gob there. So it's really ---.

22 A. It's less than 1,000.

23 Q. Yeah. And it looks like that  
24 extends all the way through to ---.

25 A. Down there.

1 Q. Okay.

2 ATTORNEY WILLIAMS:

3 To where?

4 MR. ZELANKO:

5 Through panel ---

6 A. Twelve (12) and 11.

7 MR. ZELANKO:

8 --- 12 and up into 11.

9 A. Yeah.

10 BY MR. ZELANKO:

11 Q. What's the purpose of using  
12 yielding materials in a boundary  
13 element model?

14 A. Well, coal reaches its  
15 strength --- and whatever condition  
16 it's under, will yield. And so on  
17 the ribs, you have a yielding  
18 situation. These pillars here are  
19 narrow pillars. And they often yield  
20 all the way through?

21 Q. Those pillars being the gate  
22 road pillars 30-by-100 or whatever  
23 dimension it is?

24 A. Right. And they're used  
25 extensively out west. I'm not sure

1        everywhere in the world, but --- to  
2        allow some deformation to occur but  
3        still to maintain some functionality  
4        in the mining process again. Was  
5        that your question?

6        Q. What's the purpose of using  
7        material properties?

8        A. A better yield. Because these  
9        --- we were working all the time with  
10       material that was yielding. Either  
11       it's the rib that is yielding or the  
12       whole pillar that is yielding. Were  
13       not really working in an elastic  
14       environment.

15       Q. Okay. So it's more  
16       representative of what you see the  
17       behavior to be in the field?

18       A. Uh-huh (yes).

19       Q. And the outcome of a yielded  
20       property is what, that it peaks  
21       out ---?

22       A. It might have some residual  
23       strength and still provide some  
24       function in holding up portions of  
25       the roof.

1 Q. And, in fact, that's what  
2 those equations do, is tell you what  
3 the peak is and estimate what the  
4 residual is?

5 A. Uh-huh (yes).

6 ATTORNEY WILLIAMS:

7 Is that a yes?

8 A. Yes.

9 BY MR. ZELANKO:

10 Q. And if it goes to a residual,  
11 then that load has to be transferred  
12 somewhere else?

13 A. Yes.

14 Q. So one of the functions of  
15 yielding materials is it emulates  
16 reality and it allows load to  
17 transfer as things fail?

18 A. Yes.

19 Q. All right. In the July 20th  
20 letter, which is --- I don't know  
21 which exhibit that is now.

22 A. Here it is. Exhibit Five.

23 Q. Page 100, it discusses --- it  
24 says yielding occurred in the skin  
25 all the way around the pillars, but

1 the pillar cores remained competent.

2 I wonder, what's the basis for  
3 determining that the cores are  
4 competent?

5 A. Where is this statement? On  
6 page 60?

7 Q. Page 100.

8 A. Yeah.

9 ATTORNEY MENK:

10 Right below the chart.

11 A. This one? What's the basis of  
12 saying that the pillars  
13 remain ---?

14 BY MR. ZELANKO:

15 Q. The pillar cores are  
16 competent.

17 A. Which part are we talking  
18 about in here? Are you talking about  
19 the design --- the analysis that was  
20 done in this area up here prior to --  
21 - this one was before --- this was  
22 with primary mining. It wasn't  
23 pillar retreat mining, this  
24 particular article. All right. And  
25 it's Figure 18.

1 Q. I don't know that that was ---

2 ATTORNEY MENK:

3 Is that what you're

4 referring to?

5 BY MR. ZELANKO:

6 Q. They're referring to Figure

7 18.

8 A. Yeah.

9 Q. Figure 18, which is a  
10 development figure.

11 A. All right.

12 Q. Yielding occurs in the skin,  
13 all the way around the pillar.  
14 However, the pillar cores are shown  
15 to remain competent in all locations.

16 What's the basis for saying that ---  
17 for determining that the cores are  
18 competent? Is it a stress level or -  
19 --?

20 A. Well, it's an outcome of this  
21 particular model. The model is  
22 either defined to be elastic or it's  
23 not to be yield stress in those  
24 locations. Yield condition is part  
25 of this. I think in that picture, it

1 has been 20 percent or --- it's

2 elastic. It's still elastic.

3 Q. And can an elastic element

4 fail?

5 A. Not if you define it not to

6 fail. It's an elastic element.

7 Q. Okay. So I guess the question

8 is, what's the basis for concluding

9 that competent elastic cores indicate

10 acceptable pillar performance? If,

11 in fact, they, by definition, can't

12 fail, how would they be unacceptable?

13 A. Well, the reason we went to

14 look at this place in December was to

15 get a feeling for whether or not the

16 pillars were elastic, or near

17 elastic, or yielded, or extent of

18 their yielding. Basically, on our --

19 -- and this is imposed some, I

20 believe some yielding conditions

21 around the rim of the pillar, but not

22 in the interior of the gob. When we

23 went and looked, and what we saw

24 there in, say, December, it looked

25 very competent and very minimal

1 amount of yielding on the ribs. And  
2 we then concluded that the pillars  
3 are behaving essentially elastically  
4 almost through the whole --- almost  
5 through the whole pillar. This model  
6 shows that there's a little bit of  
7 yield on the outside. I don't know  
8 what it shows in terms of what the  
9 stress level is predicted, except on,  
10 say, Figure 20 it shows a part where  
11 the pillar strength and stresses are  
12 plotted there. Something like 3,000  
13 or 4,000 PSI.

14 Q. Okay. All right. In that  
15 same document that we have equation  
16 one, that equation one defined the  
17 properties in Table One. And it  
18 defined the yielding properties based  
19 on their depth. If they were  
20 deployed in this manner that we think  
21 that they were deployed in, obviously  
22 those have elastic cores, those  
23 pillars that we looked at, 70-by-70,  
24 they couldn't be yielding properties  
25 to 37-and-a-half feet.

1 A. Right.

2 Q. What does that mean with  
3 regard to equation one? What would  
4 the coal strength be?

5 A. Well, what you're showing me  
6 is this. This isn't necessarily the  
7 same one we we're looking at earlier;  
8 is it?

9 Q. No, that's Conover's.

10 A. But this --- I don't know. I  
11 probably ought not to speculate as to  
12 what they did because I think ---

13 ATTORNEY MENK:

14 No, please don't.

15 A. --- you know, I think they did  
16 something different than what they  
17 did with them down here.

18 BY MR. ZELANKO:

19 Q. But would you agree that if  
20 you --- if you deploy in that way,  
21 with 20 feet, and use the same  
22 numbers, that the strength must ---  
23 that you used would be substantially  
24 higher than 1,640, in that equation?

25 A. That's the strength only on

1 the rib --- on the rib. It's not the  
2 strength of the interior. I mean  
3 that's one of the equations --- one  
4 of the terms of the equation.

5 Q. Right.

6 A. Right.

7 Q. And we've already established  
8 that the strength of a pillar with an  
9 elastic core would be limitless?

10 A. It could be greater than  
11 10,000. It could be 30,000 PSI.

12 Q. Okay.

13 A. We measured to 15 and 10,000  
14 plus. But the instrumentation fails  
15 above those numbers. So we don't  
16 know what the upper limit of the  
17 strength and load on the pillar is.

18 Q. Let's talk a little bit about  
19 ARMPS analysis. Agapito indicated in  
20 your written response that ARMPS has  
21 less relevance for deep mine design.

22 Can you elaborate on that? For  
23 example, does it have less relevance  
24 to deep mines than shallow mines?

25 A. I believe so. If we look at

1 the database, that is based on --- or  
2 at least is available to us, there's  
3 only a few data points in the 1,800  
4 to 2,200 foot range. And they have  
5 very low safety factors. Our  
6 experience has been that ARMPS is not  
7 supported by a lot of the evidence  
8 that we see around us in the mine.  
9 In other words, the pillars are at  
10 this depth that's quite a bit  
11 stronger than may be indicated by  
12 ARMPS.

13 Q. Okay. So you think it has  
14 less relevance to deep mines than  
15 shallow mines. Does it also have  
16 less relevance to deep mines than  
17 other types of analyses? In other  
18 words, your preference would be not  
19 to use ARMPS but to use something  
20 else?

21 A. It's always a difficult thing  
22 as to what is the strength of  
23 whatever we're dealing with. If  
24 we're doing an analysis as we do, it  
25 calculates the stress. We've always

1 got to compare that with a stress  
2 envelope or, like in here, there's  
3 mention of performance to calculate  
4 the pillar gross strength, not the  
5 individual pieces of strength. It's  
6 difficult to --- it's not a material  
7 science, predicting the strength.

8 Here's where we most often go back to  
9 the circumstances that are evident on  
10 a historical map and look at it, as  
11 we did over here, try and make a  
12 model showing that it's staying up  
13 and not all falling down, because it  
14 stayed up. And you use that as a  
15 model to go forward.

16 Q. Okay. With regard to ARMPS,  
17 do you feel like the methodology is  
18 sound? I mean, do you have problems  
19 with --- when you say it's less  
20 relevant for deep mines, do you think  
21 the methodology is sound and you just  
22 don't like their criteria or is the  
23 methodology flawed for deep cover?

24 A. Well, you know, what we read  
25 and have evidence by applying the

1       ARMPS Code to areas that stand up,  
2       that the safety factor is only .39 or  
3       .43, somewhere in that range. That's  
4       just not a very comfortable place to  
5       be. But you've got a method that  
6       says it's going to fail to a safety  
7       factor of .4, you know, and yet its  
8       functioned adequately for a long  
9       period of time. So you use it as a  
10      design tool. It just don't seem to  
11      be working very well at that depth in  
12      these conditions.

13     And, you know, it's based on  
14      historical data, based on geometries,  
15      loading conditions. It's a good  
16      start.

17     Q. You're aware, of course, that  
18      they did additional studies under  
19      deep cover and modified their  
20      recommendations and lowered it to .8?

21     A. .8.

22     Q. But it's ---?

23     A. We were quite a bit lower than  
24      that. When we recognized that and  
25      said, this is based on what has

1       functioned adequately, and we put in  
2       a higher --- you know, a higher  
3       safety factor than that.

4       Q. Okay. NIOSH's recommendations  
5       for deep cover retreat mining address  
6       both the pillar stability, that .8  
7       threshold, and they also have  
8       recommendations that pertain  
9       specifically to barrier stability  
10      between panels. Did Agapito consider  
11      the barrier stability factor?

12     A. I believe so. But I believe  
13     that --- and I don't do that. And  
14     I'm sort of talking from NIOSH said  
15     in their report. Leo did that. He  
16     did establish some analysis in these  
17     pillars here.

18     Q. But you're not sure, Leo would  
19     know for sure?

20     A. Yes. I mean, I don't think it  
21     was addressed in the report that we  
22     gave them --- gave to you on August  
23     9. But I think there were some  
24     calculations run.

25     Q. Okay. You indicated earlier,

1 I believe, in the written response,  
2 that the safety factors, or stability  
3 factors, were lower than recommended  
4 by NIOSH. But I believe it was  
5 indicated that they were felt to be  
6 acceptable relative to past  
7 experience at Genwal; is that  
8 accurate?

9 A. Uh-huh (yes).

10 ATTORNEY MENK:

11 You have to say yes.

12 A. Yes. Yes.

13 BY MR. ZELANKO:

14 Q. Was that past experience then  
15 used to establish a threshold or a  
16 mine-specific lower limit for design?

17 A. Not specifically. But I mean  
18 when we came to look at this, in  
19 expanding the length of these  
20 pillars, it increased that safety  
21 factor, increased the safety factor.  
22 It still wasn't up to .8.

23 Q. You're referring to in the  
24 south, when you ---?

25 A. The south barrier pillar.

1 Q. It had increased the stability  
2 factor relative to ---?

3 A. To what it was up in this area  
4 and to what it was in other areas of  
5 the mine.

6 Q. Okay. In April 2007, Agapito  
7 ran additional ARMPS' models. You  
8 provided them to us in the  
9 information that you sent. And we  
10 have a copy of that we'll call  
11 Exhibit 10.

12 (Michael Hardy Exhibit  
13 10 marked for  
14 identification.)

15 BY MR. ZELANKO:

16 Q. Do you know who ran those  
17 models?

18 A. Leo.

19 Q. Leo. You indicated that when  
20 you went to the south, the stability  
21 factors were increased. These  
22 numbers looked substantially lower  
23 than .37.

24 A. I think I'm referring to the  
25 stability factor of the pillar on

1 development as compared to pillar on

2 development here, the pillar on

3 development here. It was increased.

4 Q. Oh, okay, on development.

5 A. I think you're looking at some

6 of the numbers here during

7 retreating, when you got a loading --

8 - a different loading condition on

9 them.

10 Q. Okay. So the development

11 stability factors were increased?

12 A. Right.

13 Q. What about the retreat

14 stability factors?

15 A. Well, that's a different thing

16 than what's plotted on those graphs

17 that were referred to earlier about

18 the historical validity of the ARMPS

19 method. When you're in retreat

20 mining, what you do is you come in

21 here and you go down the middle of it

22 and it yields and it fails. And you

23 want that to happen so that it

24 doesn't retain too much energy that

25 when you do a next cut that you get a

1 significant energy release.  
2 So really when you're  
3 retreating, you're on the cusp of  
4 these things yielding, which is a  
5 given. You get higher loads on them  
6 then because you've got a gob on this  
7 side and solids on this side.

8 Q. ARMPS has several different  
9 stability factors, one for what they  
10 call the active mining zone, which is  
11 the pillars on the face. That  
12 includes a number of pillars, several  
13 rows, most of the time. The  
14 threshold --- I'm calling it the  
15 threshold, but the limit that was  
16 referred to in that August the  
17 9th --- I don't think we have that  
18 as an exhibit.

19 A. See, that's all that was  
20 addressed in this ---.

21 Q. The memo ---.

22 A. In this e-mail.

23 Q. The one you're looking at  
24 there, those numbers aren't  
25 development numbers, are they,

1 the ---?

2 A. The .4 and the .37, retreat  
3 conditions on the north block were  
4 generally successful, the safety  
5 factor of .37, suggesting a safety  
6 factor of .04 is a reasonable lower  
7 limit for retreat mining at Genwal.

8 Q. So they're talking about  
9 retreat mining, not development  
10 mining?

11 A. Yeah.

12 Q. So when we look at these  
13 numbers, these are also for --- the  
14 numbers that are written over here, I  
15 believe, refer to retreat mining  
16 stability factors. And so they're  
17 substantially lower than .4?

18 A. You know, as I said, I didn't  
19 do these calculations and don't know  
20 exactly if this corresponds to the  
21 final iteration or final run. I'm  
22 not sure. No.

23 Q. In fact, that's not the final  
24 run. These are shorter lengths. I  
25 believe they're ---.

1 MR. GAUNA:

2 The final run is in

3 there, it's one of the later -

4 --

5 MR. ZELANKO:

6 Yeah.

7 MR. GAUNA:

8 --- it's towards the

9 end run. There's a 130 in

10 there. A crosscut space

11 there.

12 A. There's a .44, which is

13 referred to in here, possibly.

14 BY MR. ZELANKO:

15 Q. Yeah. Let's look at ---

16 ATTORNEY WILLIAMS:

17 We're referencing

18 Exhibit Two.

19 BY MR. ZELANKO:

20 Q. .44?

21 A. That's on 80-foot ceilings and

22 92-foot crosscuts.

23 Q. At 1,500 feet?

24 A. Right. But that wasn't part of

25 the design. These would be 92.

1 Q. That was the north barrier  
2 that you just looked at?

3 A. I don't know.

4 MR. GAUNA:

5 It's about the third  
6 one back.

7 A. Here we go. It's 132, the  
8 north side.

9 ATTORNEY WILLIAMS:

10 What page is that?

11 A. 987.

12 MR. ZELANKO:

13 Yeah, that's in front  
14 of you, Mike.

15 MR. GAUNA:

16 It's going to be --- it  
17 starts on 963. It's going to  
18 be the 132 by 80s. And it's  
19 .26. That was the final ---.

20 A. Which one?

21 MR. ZELANKO:

22 Page 963.

23 MR. GAUNA:

24 Page 963.

25 BY MR. ZELANKO:

1 Q. Does it appear ---?

2 A. What's the difference between  
3 that one and 987?

4 Q. 987 is the manner in which it  
5 appears that Agapito analyzed the  
6 barrier on the north, where they  
7 incorporated the bleeder pillars into  
8 the barrier and ended up with a 210  
9 foot width.

10 A. Uh-huh (yes).

11 Q. Page 963, of course, the  
12 bleeder pillar is on the right side  
13 of the section, so it doesn't come  
14 into play here.

15 A. As I said, I don't --- I'm not  
16 familiar with this, and so I would  
17 defer if you would ask Leo if these  
18 are the depths ---.

19 Q. Okay. We can move on. I  
20 think you can see that ---

21 A. That was confusing.

22 Q. Yeah. On April the 5th,  
23 Agapito had a phone conference with  
24 Laine Adair. And it appears from  
25 your records as though it was about

1 three o'clock. Did you participate  
2 in that phone call, do you remember?

3 A. When is that?

4 Q. April the 5th.

5 A. Of 2007?

6 Q. Of 2007, yes.

7 A. I don't know. Unless I said  
8 that I did or I didn't, I would have  
9 to go back and look at my ---.

10 Q. Okay. These are notes that  
11 you provided us ---.

12 A. Yeah, I didn't participate in  
13 this one. Yeah.

14 Q. Do you know if these are notes  
15 of Gary Skaggs from that call?

16 A. Yes.

17 ATTORNEY WILLIAMS:

18 This is Exhibit 11.

19 ATTORNEY MENK:

20 And I thought you said

21 April the 5th.

22 (Michael Hardy Exhibit

23 11 marked for

24 identification.)

25 MR. ZELANKO:

1 Yes.

2 ATTORNEY MENK:

3 This is March 5th.

4 MR. ZELANKO:

5 It appears to indicate

6 March the 5th.

7 ATTORNEY MENK:

8 Okay.

9 A. What is it, do you know?

10 MR. ZELANKO:

11 It's consistent with

12 everything that you provided

13 us that says it was April the

14 5th, except that it shows

15 March the 5th.

16 A. Because you --- you know, I'm

17 thinking March the 5th, we hadn't

18 been notified of anything.

19 BY MR. ZELANKO:

20 Q. Yeah. So it does appear to be

21 consistent with just a slip of the

22 pencil on the month?

23 A. Yeah.

24 Q. Okay. Can you explain what

25 below its safety factor means? It

1 appears that Gary was making notes  
2 during this phone conference. Can  
3 you explain what below its safety  
4 factor might mean?

5 A. Sure. It says ARMPS below its  
6 safety factor, 200 --- 2,000 --- I  
7 can't read those two words. I'm  
8 sorry.

9 Q. It looks like 2,000-foot  
10 limits to me.

11 A. Yeah. Check barrier to south,  
12 the panel underground, cable ---  
13 length of cable --- length of cut  
14 distance in deep cover, length and  
15 crosscut distance in deep cover by 20  
16 to 30 feet. Re: something model. Is  
17 that ---?

18 Q. I guess with regard to that,  
19 below its safety factor, ---

20 A. Uh-huh (yes).

21 Q. --- I just wonder, do you know  
22 if he was referring to below NIOSH's  
23 level or below the threshold that you  
24 had established?

25 A. I don't know. But I think

1 over here we got a calculation of 35,  
2 40-foot cut, cut width is 35, 3, 105,  
3 35, 140. I mean, it could be that  
4 they were looking at the 92-by-80-  
5 foot output and it wasn't acceptable,  
6 they didn't like it, so they went to  
7 plan B, which is lengthen the  
8 pillars.

9 Q. Okay. And the ---?

10 A. And that's what's reflected in  
11 this report is that --- we looked at  
12 92 for quite a while. There's  
13 results for 92 and there's results  
14 extending down another cut. That  
15 must have put it --- I've not  
16 deciphered that before.

17 Q. Okay.

18 MR. ZELANKO:

19 And this figure we'll  
20 enter as Exhibit 12. It was  
21 also dated August the 5th of  
22 '07.  
23 (Michael Hardy Exhibit  
24 12 marked for  
25 identification.)

1 BY MR. ZELANKO:

2 Q. Do you know ---?

3 ATTORNEY MENK:

4 April the 5th.

5 MR. ZELANKO:

6 April the 5th of 2007.

7 BY MR. ZELANKO:

8 Q. Do you know who might have

9 made those notations?

10 A. Leo.

11 Q. And one of the things that's

12 indicated in the right there is

13 decide on depth of 40-foot barrier

14 slabbing. Do you know what was the

15 basis for choosing a 40-foot slab

16 depth?

17 A. Well, it's the cut length, but

18 also it was --- I believe intended to

19 open the span up so that you get a

20 little better cave.

21 Q. Okay. Were you ever asked to

22 --- was Agapito ever asked to

23 evaluate narrower barrier widths?

24 A. You mean with regards

25 specifically here or other locations?

1 Q. With regard to the south

2 mains ---

3 A. South mains.

4 Q. --- the south barrier section?

5 A. No, I can't. This went on ---

6 the activities that went on around

7 this April 5th time frame, I must

8 have been out of the country.

9 So ---.

10 Q. So you don't know if you were

11 ever asked to evaluate the barrier

12 widths?

13 A. No. Yeah, I might have, but I

14 don't know.

15 Q. Do you know what the actual

16 barrier width was as mined?

17 A. No.

18 Q. Okay. In the same figure,

19 there are some notes regarding stress

20 on the lower left. Were these

21 comments based on this figure alone

22 or was there some other information

23 that they looked at?

24 A. You know, I can't answer that.

25 I don't know.

1 Q. Okay. These notations seem to  
2 indicate that there's some concern  
3 with stress levels. What did Agapito  
4 do to alleviate concerns about the  
5 stress levels?

6 A. Well, I believe that this is  
7 for the 92-foot case. Is that your  
8 belief?

9 Q. It does look like 92.

10 A. Yeah. So I believe that the  
11 discussion was had and they decided  
12 to increase the size of the pillar.

13 Q. Okay.

14 A. I believe. Like I said, I  
15 wasn't in those conversations. But I  
16 know that's what the end result was.

17 Q. All right. In your written  
18 response to us, you --- we asked you  
19 to address some questions we had  
20 regarding short term and long term.  
21 Could you clarify what those terms  
22 mean to you, short term and long  
23 term, in terms of design? How might  
24 the design differ for a short-term  
25 entry versus a long term and why?

1       A. Well, long term is often ---  
2       there is obviously more events that  
3       can occur, more creep that can occur,  
4       the more --- just time-dependent  
5       activity, whether it's actually  
6       triggered by some vibrations, or  
7       moving equipment, or whatever, or it  
8       can be termed by --- like this is a  
9       long-term situation and mining is  
10      going to occur here dramatically  
11      sometime in the future.

12     But depending on how frequent  
13      people travel in there and what the  
14      functions are of the openings, there  
15      would be much --- a lot better ground  
16      support, and so there was a very low  
17      probability of an unpredicted roof  
18      fall occurring. But a short-term  
19      thing is something which you're in  
20      and you're out in a fairly short  
21      period of time. Unsuspecting people  
22      aren't going to be exposed to any  
23      risk. The miners are in protected  
24      conditions and inspecting the  
25      workings before they go into them and

1 can get out of them fairly quickly.

2 Now, this would be considered a  
3 short-term operation, a few months  
4 you're in and you're out.

5 Q. This refers to the north  
6 section?

7 A. The north section. The design  
8 of this was originally designed ---  
9 these are the mains, were designed by  
10 somebody, no doubt, to be of a long-  
11 term nature, to protect access down  
12 this way, as they expected to do  
13 panels up and down in this direction.  
14 They subsequently weren't used for  
15 that. But this is --- and the mains  
16 going north up there would be  
17 considered a long-time functional  
18 use, whereas what they've been doing  
19 down here, retreat mining, they're  
20 coming out, it was the last phase of  
21 the mine, and they're not going to go  
22 back in there. Once they've  
23 retreated out of here, they're never  
24 going to go back in there. They  
25 don't have to protect ventilation and

1 pumps and access.  
2 So it's fairly subjective. I  
3 mean, you still have ground support  
4 and you still have --- maintain the  
5 safety of the workers at all times.  
6 But it's --- you might go to an extra  
7 level of ground support here and make  
8 bigger pillars here, so that you  
9 don't get any sloughage. And even if  
10 in ten years, it sloughed five feet,  
11 it might not affect anything.

12 MR. ZELANKO:

13 Off the record.

14 OFF RECORD DISCUSSION

15 MR. ZELANKO:

16 We're back on the  
17 record.

18 BY MR. ZELANKO:

19 Q. Do you recall work that  
20 Agapito did on barrier design at  
21 Crandall Canyon in 2000? We have an  
22 exhibit, I think we labeled it 13, a  
23 final memo to Genwal.

24 A. I guess I signed it, so I  
25 remember it.

1 Q. Okay. What was the purpose of  
2 the project?

3 A. Give me a minute. So is  
4 this ---? What panel number is this  
5 one?

6 Q. Thirteen (13).

7 A. Thirteen (13). It says we're  
8 looking at something ---.

9 ATTORNEY MENK:

10 Just read the whole  
11 thing.

12 A. Yeah. The below summary is a  
13 result of an analysis of defective  
14 barrier ---

15 ATTORNEY MENK:

16 Read it to yourself.

17 A. --- pillar widths on future  
18 bleeder entry stability for panel 15  
19 south of the west mains. Results of  
20 computer models can be found in  
21 figures one, two and three.  
22 Empirical barrier design methods have  
23 been applied, and they're summarized  
24 in Figure four as an additional aid.

25

1 A study was initiated during  
2 my site visit on March 15th, 2000.  
3 These analyses were completed in  
4 April and the results communicated to  
5 you during a conference call  
6 involving Grace Goodrich, Karl Free  
7 (phonetic), and myself on April 5,  
8 2000.

9 This letter provides a written  
10 backup to support the decision to  
11 proceed with barrier pillars of 240-  
12 feet width. The analysis for same  
13 was performed by Karl Free. Now,  
14 this was to do with the size of the  
15 barrier pillar at the bleeder end of  
16 the property, I think it was the  
17 Joe's Valley Fault. Okay.

18 BY MR. ZELANKO:

19 Q. And the recommended barrier  
20 design was 240 feet for long-term  
21 stability and would have been 400  
22 feet for long-term. 240 was what it  
23 was. Had it required long-term  
24 stability, your recommendation would  
25 have been 400 feet?

1       A. Well, the question arose ---  
2       I'm just telling you some of my  
3       recollections of the time. They were  
4       expecting to get a lease for the  
5       southern portion, which would have  
6       had the mine further south of the  
7       current leased mine for many more  
8       years. And so there was a concern  
9       that they needed to keep this bleeder  
10      line open for longer than it was  
11      designed for initially, which was a  
12      cutting off, you know, a few pounds  
13      below 15 versus if they got that at  
14      lease, they would have been going  
15      maybe another 10 years or something.

16      So that was a long-term/short-term  
17      consideration.

18      Q. And what was the purpose of  
19      the barrier in that case with regard  
20      to the bleeder entries?

21      A. It's to protect the bleeder  
22      entry because they were heavily  
23      supported. Through time they ended  
24      up with posts and props --- they had  
25      quite a lot of support in there to

1 maintain them. Obviously, it's a  
2 ventilation pathway, but it also has  
3 to be traveled by people, maybe once  
4 a week, to do inspection. But bear  
5 in mind, it's a barrier pillar that's  
6 got underload from this side. It  
7 doesn't have any load from this side.  
8 There's no mining on the western side  
9 of this. It's a two-entry bleeder, I  
10 believe, isn't it?

11 Q. Right. And what would have  
12 been the implications in this case  
13 versus if it had been on the other  
14 side? If there had been mining on  
15 the other side?

16 A. Well, they would have thrown  
17 an additional load onto it.

18 Q. So it would have been worse?

19 A. Uh-huh (yes).

20 Q. In this case, you ended up  
21 recommending a 240-foot barrier for a  
22 short term or 400 for long term. Why  
23 such a big ---?

24 A. Well, the short-term yield was  
25 still a very long period. It was not

1 a short term like I described for the  
2 recovery and retreating out of this  
3 barrier pillar up here. The short  
4 term here would have been for another  
5 3 to 5 years, whereas the long term  
6 would have been for 10 or 15 years.  
7 And their concern was they --- and  
8 we've done this before with them and  
9 looked at these analyses-type things.

10 And we get a bleed-off, and the  
11 effect of the mining was --- had a  
12 very, very minor effect on the area  
13 that you would have had to have the  
14 bleeders or additional mining. That  
15 was a very --- this was some of the  
16 analysis that led to the conclusion  
17 of 240 or 260 feet. But ---.

18 Q. You're referring to ---

19 A. Figure two.

20 Q. --- figure two in Exhibit 13?

21 A. Yes.

22 (Michael Hardy Exhibit  
23 13 marked for  
24 identification.)

25 BY MR. ZELANKO:

1 Q. With the big pillar, the  
2 abutment pillar 240-feet wide, why so  
3 big? Was there concern about the  
4 barrier pillar stability?

5 A. No.

6 Q. No?

7 A. There was purely concern about  
8 any damage or any change in  
9 conditions in that bleeder.

10 Q. Okay. So the intent was to  
11 isolate the bleeder as much as  
12 possible from the longwall abutment  
13 stress?

14 A. Yes.

15 Q. Okay. And how far in  
16 figure --- is it two?

17 A. That's figure two.

18 Q. In figure two, how far did the  
19 modeling show that abutment stress  
20 transferred from that panel 15, from  
21 the back end?

22 A. Is this a percentage, is this  
23 79 percent?

24 Q. I believe it is.

25 A. It looks like it says stress

1 increased due to longwall mining,  
2 percent. So if you're far enough  
3 out, you'd be zero percent change.

4 And he was 70 and 15 percent  
5 influence of the barrier pillar on  
6 this particular location of the  
7 bleeder. It might have been.

8 BY MR. ZELANKO:

9 Q. So at a distance of about,  
10 say, a hundred feet, what would you  
11 estimate ---?

12 A. Forty (40) percent.

13 Q. Forty (40) percent. Okay.

14 Can we compare that then to the  
15 figure in the July 20th report? I  
16 think it was Figure 20 on page 121.

17 A. Which one is this?

18 Q. You have that one over here.

19 The July 20th report is Exhibit 5.

20 A. July 20th?

21 Q. Figure 20. Kind of at the end  
22 of the map.

23 A. I believe it's one of these  
24 figures; right?

25 Q. Right.

1 A. It's a very steep decline.

2 What's the figure?

3 Q. Twenty (20).

4 A. Twenty (20)?

5 Q. Yeah. It's just a few from  
6 there. So at a hundred feet there, I  
7 think in the text it says that it's  
8 near in situ. Can you explain why  
9 the results would be so different?

10 A. This is --- you say from here  
11 to here. It's almost back to pre-  
12 existing stress level.

13 Q. Yeah. Let me --- rather than  
14 you trust my recollection, I'll find  
15 it. This is on page 99. It says for  
16 the current geometry, stress levels  
17 taper to near premining or in situ  
18 stress levels approximately a hundred  
19 feet into the barrier, indicating  
20 that the proposed 130-foot-wide  
21 barrier will limit exposure of the  
22 planned entries and pillars to most  
23 of the abutment. And I guess the  
24 question is, these were both models  
25 run fairly close to one another, one

1 for panel 12 and another for 15. And  
2 the distribution of the abutment  
3 stress is markedly different.

4 A. Yeah. You know, I don't know  
5 what per se off the top of my head  
6 what the difference is. This is  
7 presumably with EXPAREA, ---

8 Q. Right.

9 A. --- and this is with LAMODEL.  
10 And that's somewhat surprising. I  
11 think that's surprising. There's a  
12 rapid decline.

13 Q. Do you know why that might be?

14 A. It could be --- to do with  
15 LAMODEL laminated characteristics  
16 that are not in EXPAREA.

17 Q. Did Laine Adair or other  
18 company personnel tell Agapito that  
19 Genwal had seen abutment stress  
20 effects in the Main West entries when  
21 panels 12 and 13 were pulled?

22 A. Twelve (12) and 13?

23 Q. Yeah. Did they ever indicate  
24 to you that they could see the  
25 effects of pulling these panels?

1       When this one was pulled, they saw  
2       some damage in the Main West, and  
3       when the other one was pulled they  
4       saw some damage up there?

5       A. Yes.

6       Q. What does that imply to you?

7       A. Well, there's a slight ---  
8       they had a load transfer from here  
9       over to here. This is a fairly wide  
10      barrier. I think it may have been  
11      associated with some structure that  
12      went down into this area. I don't  
13      think he ever said to us it was up  
14      here or here or here. But I think  
15      when this went by, there's a little  
16      bit of damage, a little bit of  
17      evidence over here. And that was why  
18      these things were fairly large.

19      Q. That's sort of a verbal  
20      truthing. That's the sort of thing  
21      we often use to truth models. Would  
22      it be more consistent with this  
23      figure or the other figure?

24      A. It would be more consistent  
25      with this figure than the other

1 figure.

2 Q. That one being the one that  
3 was done on the panel 15 model?

4 A. But on the other hand ---  
5 well, I mean, we didn't quantify what  
6 that meant when he said there was  
7 some evidence. But I know there was  
8 some structure over here. We went  
9 for one day and we walked around  
10 here, down on this end.

11 ATTORNEY WILLIAMS:

12 In the west mains?

13 A. In the west mains. And I  
14 presume it was around the time of  
15 2000 and something. It wasn't --- or  
16 it might have been earlier than that  
17 because this was '99. This is  
18 presumably the next year or close to  
19 the next year. But that was the  
20 reason we went and walked around  
21 there, was to look at that, but  
22 really couldn't see much from our  
23 perspective.

24 BY MR. ZELANKO:

25 Q. Okay.

1           A. So we had to be kind of  
2           walking there every day maybe to see  
3           some change on some day ---.

4   MR. GAUNA:

5   For the record, he said  
6           which figure or that figure.  
7           I don't know which one he's  
8           talking about.

9   ATTORNEY WILLIAMS:

10   When you were referring  
11          to that figure, I think you  
12          were referring to Exhibit 13;  
13          correct?

14          A. That's correct, Figure 13.

15   ATTORNEY WILLIAMS:

16          Or Exhibit 13.

17          A. Yeah, Exhibit 13, Figure two.

18          That's Figure ---.

19   ATTORNEY WILLIAMS:

20          Page 42 would be six.

21   MR. ZELANKO:

22   Figure two. Doctor  
23          Hardy indicated that ---.

24   BY MR. ZELANKO:

25   Q. Let me paraphrase and you tell

1 me if I'm wrong, but basically if you  
2 look at Figure two in Exhibit 13, it  
3 shows abutment stress transfer over a  
4 distance that would be consistent  
5 with when a longwall panel mines by  
6 the old west mains, you might see  
7 some minimal amount of stress  
8 transfer.

9 A. Well, this is --- yeah, this  
10 is --- as I say --- is this 400 feet  
11 or 300 feet?

12 Q. I think it was about 450.

13 A. 450. Which would put you out  
14 over here and not in this region  
15 here. You're pointing to Figure two.

16 Q. So you would anticipate ---  
17 using Figure two in this Exhibit 13,  
18 beyond the barrier width of 450,  
19 you'd still estimate maybe ten  
20 percent stress transfer. But in the  
21 model that's shown in Figure 20, in  
22 Exhibit Five, ---

23 A. It's a much steeper decline.

24 Q. --- a much steeper decline and  
25 it wouldn't --- typically, you

1       wouldn't expect to see that type  
2       stress transfer at the distances  
3       we're talking here, 450 feet?

4       A. No.

5       Q. Okay.

6       ATTORNEY WILLIAMS:

7       Is that right?

8       A. I mean, just from the face  
9       value of what I see there, it looks  
10      like it's a much steeper decline than  
11      what was shown in this analysis here,  
12      this being the 2000 analysis in  
13      Exhibit 13.

14      BY MR. ZELANKO:

15      Q. Okay. And I believe we asked  
16      you about this in the written  
17      questions. We said in the second  
18      north mains, much --- a while ago,  
19      there was some indication of stress  
20      transfer onto the north mains as  
21      those panels were pulled out and  
22      stopped.

23      A. This is in the north mains, up  
24      there?

25      Q. That's correct, as panels,

1 say, 8 through 12 were pulled, there  
2 was some indication of damage in the  
3 second north mains. But you  
4 responded in the written response  
5 that there was minimal evidence of  
6 abutment load. That would be on page  
7 9971.

8 MR. ZELANKO:

9 We're about done.

10 A. 9971. What's your question?

11 BY MR. ZELANKO:

12 Q. Sixty-nine (69).

13 A. Sixty-nine (69). Okay.

14 ATTORNEY WILLIAMS:

15 In Exhibit One.

16 A. I mean, I can't remember what  
17 the indications were of that load  
18 transfer. When we're there, we talk  
19 about these things, and somebody will  
20 say they saw something and somebody  
21 will say I didn't notice anything.  
22 So how effective it was, I'm not  
23 sure. I don't know if we wrote up a  
24 trip report related to this, but this  
25 has got to be back here in '95 to

1 '97.

2 BY MR. ZELANKO:

3 Q. It's sometime there. Maybe

4 '97.

5 A. Yeah.

6 Q. I just wondered. I know I've

7 seen somewhere in the written records

8 that the roof was a little tender up

9 there. And I just wondered if that

10 stress manifested itself as ---

11 sometimes I think it's easier to see

12 it in roof conditions deteriorating

13 than just a little bit more rib

14 sloughage, especially under these

15 deeper cover --- in these deeper

16 cover situations.

17 But I --- it sounds like it's

18 been a while ago and you don't recall

19 specifically what it was.

20 A. Right.

21 Q. But it is an indication, is it

22 not, of abutment stress transfer,

23 again, over a relatively long

24 distance?

25 A. Yeah. To some degree, yes.

1 But remember, what we're doing here  
2 is a different situation. The loads  
3 had been transferred. I mean,  
4 whatever was load was there was  
5 transferred over to here. And  
6 subsequently, five years or six years  
7 of consolidation has occurred here.  
8 Then we go in the mine, all right.  
9 So we're not seeing the --- we're not  
10 seeing in the location of what we've  
11 already mined and the effect of  
12 mining over there. We're mining now  
13 into this barrier pillar.  
14 And the question was in  
15 December, what does it look like?  
16 Does it look like what you expect it  
17 to look like from the model, which  
18 may or may not be correct, you know,  
19 in terms of what parameters we've put  
20 in there. Or were we seeing anything  
21 that would give us a clue that there  
22 was a lot of load transfer in here  
23 and the mining conditions were  
24 significantly worse than mining in  
25 virgin ground.

1 And mining on virgin ground  
2 here was very like what we saw when  
3 we went there. We were under 1,900  
4 feet of cover. It didn't look like  
5 we were under 2,500 feet of cover or  
6 20 or 30 percent greater stress,  
7 which might be implied by something  
8 like that, you know. So gave us some  
9 comfort to what --- whatever the  
10 model is, and whether it was right or  
11 wrong, we --- if this was now  
12 sloughing --- and I'm sure MSHA would  
13 have said, you ought to get someone  
14 else in there to look at this, or  
15 questioned moving forward because the  
16 conditions weren't as we expected.  
17 We expected kind of benign  
18 conditions, and that's what we got, I  
19 presume, from here out to there  
20 because we didn't see what the  
21 conditions were like coming back  
22 here. We just saw this condition.

23 Q. But did you anticipate that  
24 condition?

25 A. No, we didn't. But as we

1       said, you know, it may have been  
2       influenced by this, this thing. That  
3       was the only different thing that we  
4       saw that was from what we looked at.

5   ATTORNEY WILLIAMS:

6   And that condition,  
7       you're referring to the big,  
8       bump/bounce in the north  
9       barrier?

10   A. I'm referring to the leaving  
11   behind these five --- well, actually  
12   five-and-a-half pillars here and then  
13   starting up again relatively close.  
14   If it started up back here, I think  
15   it would have been a lot less of an  
16   issue. But we didn't get involved in  
17   that.

18   BY MR. ZELANKO:

19   Q. If we look at April the 18th,  
20   Exhibit Seven --- do you have that  
21   one?

22   A. Yes.

23   Q. If we look at Figure five,  
24   look at Figure five initially, was  
25   there ever any discussion that

1 perhaps even though it looked good in  
2 December and didn't show a lot of  
3 sign of abutment stress, that based  
4 on what it looked like in March,  
5 maybe the model wasn't representing  
6 the situation very well?

7 A. I can't --- I don't --- I  
8 think that the observation was if  
9 we're mining in this area here, this  
10 is where people are at and people are  
11 at risk. Whether these burst or  
12 bumped down here is not a significant  
13 concern. We're worried about what's  
14 going on this immediate area where  
15 the men are working. And as long as  
16 we don't have this situation where a  
17 big bump like that occurred, or a  
18 bump of some magnitude occurred, and  
19 we were restarting again, we could  
20 continue to mine and slab off here  
21 and retreat out of there.

22 Q. I guess when I --- I would ask  
23 you in this Figure five of this  
24 exhibit, Bates page 220, if I look at  
25 these pillars between Crosscut 136

1 and 137, and I contrast them with  
2 this pillar row one row outby, do you  
3 see much difference there?

4 A. Recognizing that when  
5 this --- when this fails or yields,  
6 it throws more loads over into these  
7 ones, which I presume happened,  
8 either instantaneously or quickly.  
9 And it may have thrown loads over in  
10 here as well. But we don't have that  
11 failure kind of thing happening  
12 there. This is a safe --- you know,  
13 if this was mined out, this would  
14 still be a safe working area.

15 Q. Okay.

16 A. But I'm not going to say that  
17 the model is entirely accurate.  
18 There is no model that we're using  
19 that is.

20 Q. Okay. In the barrier pillar  
21 report --- I'm sorry to keep  
22 switching back and forth, but I think  
23 it's this one, Exhibit 13. We had  
24 asked you earlier why the barrier  
25 pillar formulas that you used in that

1 report weren't used. And you said  
2 they were limited to cover less than  
3 2,000 feet. Does that include the  
4 North American method as well?

5 A. There's one method that was  
6 --- which one was it? There was one  
7 that was --- that doesn't have that  
8 disclaimer on it. But I think you --  
9 - you know, the important thing about  
10 looking at that table, and which was  
11 really --- I thought there was a  
12 table in here.

13 Q. It's clear at the end there.

14 A. This one here. Is how  
15 variable those things are. The one  
16 that we did put down there as 2,500  
17 is the --- the North American method  
18 was 807 feet to 2,500 feet.

19 Q. In this situation, you would  
20 have looked at 2,000 to 2,200, so it  
21 would have been less than that?

22 A. Uh-huh (yes).

23 Q. The table indicates how wide  
24 for 2,000 feet?

25 A. For that method, it's 620

1 feet.

2 Q. So that's a substantial

3 barrier?

4 A. Yeah.

5 Q. Was that considered at all in

6 this ---?

7 A. In which? In this study here?

8 Q. In the analysis that was done

9 for project 20?

10 A. I don't think so.

11 Q. Okay. How does a 2,000-foot

12 limit limit the applicability of

13 those pillar formulas in this case?

14 When I look at the panel 15, the

15 recommendations are somewhat in line

16 with those barrier pillar formulas.

17 Why wouldn't it be that way in the

18 more recent ---?

19 A. Well, I believe that in the

20 write-ups of Holland --- in Holland

21 and Pennsylvania they limit their

22 application of the formula to that

23 level. Now, whether or not it's

24 valid in 2,000 or not is --- or

25 2,200, or whatever, is questionable.

1 Q. Most of the west mains is  
2 under 2,000 feet. It's under 2,000  
3 feet, so it might be relevant there.

4 A. But is the question about the  
5 size of a barrier pillar or the size  
6 of this barrier pillar or this  
7 barrier pillar? This was a 450-foot  
8 barrier pillar, which is --- these  
9 methods I used to design those sort  
10 of long-term barrier pillars.

11 Each barrier pillar here is  
12 essentially a breaker row --- no, not  
13 a breaker row, a ventilation barrier  
14 against that. And structurally, in  
15 other locations, people have gone  
16 much closer than that. In fact, they  
17 did down in the south, in under 2,000  
18 feet of cover, adjacent to mature  
19 gobs. So this is not --- this design  
20 methodology doesn't --- isn't very  
21 meaningful against a thing like this.

22 Q. Okay. I don't know that I  
23 follow that exactly. The purpose of  
24 this barrier was to shield those  
25 workings from the abutment stress

1 associated with this gob.

2 ATTORNEY MENK:

3 Which barrier?

4 MR. ZELANKO:

5 The barrier between the

6 panel 12 and the north barrier

7 working section.

8 ATTORNEY MENK:

9 Well, see, the problem

10 is, he's defined two barriers.

11 I mean, there's a 450-foot

12 barrier that existed before

13 they mined it, and then

14 there's a barrier that exists

15 after they mine it. And I'm

16 just curious as to which of

17 those barriers you're talking

18 about.

19 MR. ZELANKO:

20 For the sake of

21 clarifying it, let's refer to

22 the 450-foot barrier and the

23 135-foot barrier.

24 A. Okay.

25 MR. ZELANKO:

1 The purpose ---.

2 ATTORNEY WILLIAMS:

3 And for the sake of the

4 record, the former is between

5 the Main West and the gob;

6 right? The west mains and the

7 gob?

8 A. Yeah.

9 MR. ZELANKO:

10 And the 135-foot is

11 between the north barrier

12 section and the gob.

13 BY MR. ZELANKO:

14 Q. But isn't the function of each

15 of those barriers to protect those

16 workings, be it the Main West

17 original workings or the north

18 barrier section from abutment stress?

19 A. When this activity was taking

20 place, they're retreating out of this

21 mine. And so they no longer need the

22 mains to function as a pathway of

23 ventilation, a pump station, whatever

24 else it was. They're already sealed

25 off back here. So they're not

1 concerned about maintaining long-term  
2 stability in the mains. This has  
3 already collapsed and fallen in and  
4 the load has been transferred through  
5 there, we believe. The model didn't  
6 show that. We didn't do that in the  
7 model. And now we're coming back in  
8 here. And the only reason they're  
9 leaving that is for ventilation.

10 Q. That being 121 feet?

11 A. Right. What its structural  
12 component is, is questionable.  
13 Whether or not it was going to yield  
14 or slab off in here, slab down in  
15 here, you know, it really wasn't  
16 designed to carry all the load. This  
17 is all gone, this is going to carry  
18 all the load, because it might have  
19 burst. I mean, back here it might  
20 have burst. I don't know.

21 But that's the difference  
22 between the design of this feature  
23 here versus this. Now, this feature  
24 here, the big barrier pillar, was  
25 designed by --- I'm not sure whether

1 we did it or we communicated doing  
2 that, but it's a 450 or 400-foot  
3 structure, which is quite  
4 conservative relative to three out of  
5 four of these design methods.

6 Now, when we were applying  
7 these, we were applying them to a  
8 different barrier pillar with a  
9 different function over here to  
10 protect the bleeders in the back end.

11 And we used a different methodology  
12 --- you know, what we talked about,  
13 as the stress decreased away from the  
14 end of the gob down here in the  
15 mains.

16 And so this range is  
17 horrendous. I mean, they didn't  
18 choose the highest value here for the  
19 size of this barrier, but they ---  
20 their design --- if you didn't know  
21 about that method, these three  
22 methods would have given us a barrier  
23 pillar here on top of that. And for  
24 whatever reason, they build a big  
25 450-one in there. But we're not

1 requiring that to be a stable, long-  
2 term pillar to --- after we've  
3 retreated out of here, we're not  
4 concerned with what it does. It's  
5 not ---.

6 Q. Right. But in the same way  
7 that the barrier that you left at the  
8 back of panel 15 shielded those  
9 bleeder entries from abutment  
10 stress, ---

11 A. Uh-huh (yes).

12 Q. --- doesn't this 135-foot  
13 barrier --- doesn't it serve the same  
14 function, to carry a big portion of  
15 that abutment stress? And if it's  
16 too narrow, doesn't a lot of that  
17 abutment stress sit right on the  
18 workings and change what those pillar  
19 stability factors would be in the  
20 development section?

21 A. You know, my point I've  
22 mentioned before is that whatever the  
23 load transfer over there was or is,  
24 we went in and looked and observed  
25 the pillar conditions prior to the

1       retreating going on. And we believe  
2       that that verified that there was  
3       very little load transfer across this  
4       barrier pillar.

5       Q. Okay.

6       A. And that's why we didn't  
7       proceed on with ---.

8       Q. Okay.

9       A. Now, whatever happened down  
10      here --- recall these panel ---  
11      pillars here were performing, I  
12      believe, from the point of view of  
13      the mining operator, in an adequate  
14      fashion, doing something down here,  
15      under fairly low cover when something  
16      else happened.

17      ATTORNEY WILLIAMS:

18      You're referring to the  
19      south barrier?

20      A. South barrier, yeah.

21      BY MR. ZELANKO:

22      Q. Did you consider surface  
23      subsidence data in the pillaring  
24      analysis project, project 20?

25      A. We were aware of it and we saw

1 the data. We actually didn't bring  
2 that data back here until later on.  
3 But we had seen it, and we discussed  
4 it, and we knew that there was very  
5 good convergence down here. And all  
6 of the other evidence suggested that  
7 there had been good convergence up  
8 here.

9 I don't know whether you've  
10 heard the story of --- I actually  
11 referred to it earlier on. At one  
12 point in time there was a data point  
13 that indicated there was subsidence  
14 up here. We thought that was  
15 anomalous. But if it was correct, it  
16 indicated a big disaster could happen  
17 when all this came down in one big  
18 event. So they went back and did  
19 some better surveying of points on  
20 the ground and confirmed that  
21 subsidence had happened. Otherwise,  
22 we were concerned.

23 And I think I --- in the  
24 answer to this, I provided a copy of  
25 a drawing that shows some of the

1 subsidence data from the south.

2 Q. Page 21?

3 A. Yeah.

4 ATTORNEY WILLIAMS:

5 Of Exhibit One.

6 BY MR. ZELANKO:

7 Q. As I look at this, where would  
8 you suggest, based on those profiles,  
9 the super critical width of those ---  
10 that subsidence profile would be  
11 relative, I guess, to the gate roads?

12 You can see panel 13 and then the  
13 gate road, panel 14, and a gate road,  
14 and then panel 15.

15 A. You know, this is at a depth,  
16 I think, of --- I think it's up on  
17 the high points, it's 2,000 feet  
18 deep. So this panel width is about  
19 800-feet wide.

20 Q. 7-7 something.

21 A. 7-7. So it could be --- it  
22 could be a couple hundred feet. I  
23 don't know what the --- it doesn't  
24 look like there's very much ---.  
25 Well, we really don't know where the

1 zero point is, I suppose, we have to  
2 say. But it's a --- right, a couple  
3 --- five feet of subsidence.

4 Q. Yeah. It looks like five feet  
5 out there about the gate road,  
6 between 13 and 14. So the  
7 implication of that is that that's  
8 subsided about as much as it's going  
9 to at that point?

10 A. Well, I haven't --- I think  
11 there's one dataset of survey points  
12 here from --- it says '07.

13 Q. Uh-huh (yes).

14 A. The previous one was '06. And  
15 there was nothing in '05. There  
16 wasn't data there. So there's a  
17 purple line, and I guess the '07 line  
18 is a black line.

19 Q. Right.

20 A. Which might indicate that over  
21 here on the left side there's been  
22 some subsidence located between '05  
23 and '07. But there wasn't much  
24 additional subsidence over here. And  
25 this, of course, could be due to

1       whatever happened down here.

2       Q. Right. But I guess --- as I  
3       look at these curves, what's the  
4       implication of not having a lot of  
5       subsidence all the way out to the  
6       middle of that panel 13? Isn't it  
7       that that isn't --- it's not a  
8       critical cave over that area; is that  
9       not correct?

10      A. I think you'd expect if it had  
11      caved completely in here, you'd get a  
12      little bit of --- depending what the  
13      angle of the draw is.

14      Q. Sharper drop-off?

15      A. Sharper drop-off, yeah.

16      Q. So this is sort of indicating  
17      then that you're going to have some  
18      weight that's sitting back on those  
19      old mains and barriers?

20      A. It could. That's a very  
21      indirect interpretation of that. We  
22      do not know what the angle of the  
23      draw is in there, you know, what's  
24      happening between there and down  
25      below. All right.

1 Q. Okay.

2 A. The implication is that there  
3 should have been a lot of load  
4 transfer over here, which is, I  
5 think, where you're going, is that  
6 there's --- maybe there's a lot of  
7 cantilevering out over here. Would  
8 you see the same kind of favorable  
9 mining conditions as you mined this  
10 on the first pass? You're mining  
11 under not only 2,200 feet of cover  
12 but some overload from that, which  
13 gets you in --- pretty quickly into  
14 some pretty dangerous territory. I  
15 personally don't know what happened  
16 down there, you know, we didn't go  
17 into that situation.

18 MR. ZELANKO:

19 The only thing that I  
20 find intriguing is that we do  
21 see a difference in the  
22 sequence of things. I guess  
23 it's most obvious in multiple  
24 seam. If you take a multiple-  
25 seam mine and a seam above and

1       you mine the lower seam after  
2       this one is driven, everything  
3       is really busted up, really  
4       difficult conditions.

5    On the other hand, if  
6       you mine this first and then  
7       go over it, it still could be  
8       bad, but it's not as bad.  And  
9       I wonder sometimes, in these  
10      kind of situations, had you  
11      driven these entries and then  
12      pulled this, just the nature  
13      of what you see as evidence of  
14      high stress is different than  
15      once you have the high stress  
16      and you mine through it.

17    ATTORNEY MENK:

18    Hang on.  Hang on.

19    MR. ZELANKO:

20    You don't have to  
21      answer.

22    ATTORNEY MENK:

23    That's not a question.

24      It would be completely  
25      hypothetical, and I don't want

1           you to answer.

2       MR. ZELANKO:

3       That's two engineers

4           talking. All right.

5       ATTORNEY MENK:

6       But it's fascinating to

7           watch, though.

8       BY MR. ZELANKO:

9           Q. Is it possible that could be  
10          the case?

11       ATTORNEY MENK:

12       Don't answer that.

13       BY MR. ZELANKO:

14           Q. Has Agapito rerun any of the  
15          models since August 2007?

16           A. No.

17       MR. ZELANKO:

18       He'll tell you not to  
19          answer if I say do you plan  
20          to.

21           A. I guess we're not allowed to.

22       ATTORNEY WILLIAMS:

23       Why don't you let us  
24          kibitz for two minutes and see  
25          what follow-ups we may have.

1 OFF RECORD DISCUSSION

2 BY MR. ZELANKO:

3 Q. Earlier you mentioned using  
4 narrower barrier pillars adjacent to  
5 gobs, and you referred to in the  
6 south. Just for the record, can you  
7 confirm, you meant in the south mains  
8 pillaring area?

9 ATTORNEY MENK:

10 Do you understand what  
11 he's asking?

12 A. No.

13 BY MR. ZELANKO:

14 Q. Earlier you said that there  
15 are examples that you can cite in  
16 this mine where they've mined even  
17 smaller barrier pillars.

18 A. I know the question now. It's  
19 either to the south, where they were  
20 doing retreat mining --- and I  
21 honestly don't know the exact  
22 dimensions that they mined up to. It  
23 might be the same order of 110 feet.

24 I don't know. But in the other ---  
25 some other mines that we're familiar

1 with as being close to the mine, two  
2 gobs, then ---.

3 Q. For example, Pinnacle Mine, is  
4 that one that ---?

5 A. No. I'd say Sunnyside.

6 Q. Sunnyside. Okay. In the  
7 south mains, if --- that is what you  
8 were referring to earlier when you  
9 said about mining closer?

10 A. Yeah.

11 Q. Are you familiar with the  
12 mining system they were using to mine  
13 those south mains?

14 A. No.

15 MR. ZELANKO:

16 Okay. It was a  
17 different system. To my  
18 knowledge, they were rooming  
19 out and then pulling the  
20 pillars and then rooming out  
21 and pulling the pillars, as  
22 opposed to driving through the  
23 barrier. That's not a  
24 question either. I can tell.

25 ATTORNEY MENK:

1 That's information.

2 BY MR. ZELANKO:

3 Q. As we've gone through the  
4 course of questions today, I  
5 appreciate your willingness to answer  
6 them to the best of your knowledge.  
7 There have been quite a few that you  
8 deferred to others in the  
9 organization to provide more detailed  
10 answers. I think you said Bo Yu did  
11 most of the modeling, and Leo  
12 Gilbride oversaw a lot of that and  
13 made the interpretation.

14 In light of that, is there any  
15 --- would it be possible for us to  
16 sit down with Bo and Leo and ask some  
17 further questions about this?

18 ATTORNEY MENK:

19 Why don't you direct  
20 that inquiry through me?  
21 Okay. Tell me --- you know,  
22 you or somebody get in touch  
23 with me and tell me what you  
24 want to do and we'll talk  
25 about. We certainly have more

1 control over Bo than we do

2 over Leo.

3 ATTORNEY WILLIAMS:

4 Bo is a current

5 employee; is that correct?

6 ATTORNEY MENK:

7 Yes.

8 ATTORNEY WILLIAMS:

9 Does Leo have any

10 association with the firm

11 anymore?

12 A. He's not an employee and he's

13 not in the ownership position. He's

14 expressed a desire to have no further

15 involvement. And so when we call

16 him, we ask him what does he want to

17 do, you know. We can't tell him what

18 to do. So I don't know --- I don't

19 think --- there's no --- I don't

20 believe there's any formal

21 relationship.

22 BY MR. ZELANKO:

23 Q. This is just one more

24 question. I thought I was done, but

25 it just occurred to me. As people

1 transition out of the company, do you  
2 make an effort to retain that  
3 historical knowledge, to pass it on?

4 A. Well, at least insomuch as  
5 files, reports, and all those  
6 functions.

7 Q. So the institutional knowledge  
8 that's passed along is in that form,  
9 the previous reports?

10 A. Uh-huh (yes).

11 Q. Okay.

12 ATTORNEY WILLIAMS:

13 Is that a yes?

14 A. Yes.

15 MR. GATES:

16 But as far as --- I  
17 guess Bo --- I mean, I don't  
18 know what --- certainly I have  
19 no idea what his availability  
20 may be, if at all. I mean, we  
21 are in Colorado now. Would  
22 there be any way possible ---?

23 ATTORNEY MENK:

24 Well, he's not going to

25 do it today ---

1 MR. GATES:

2 Well, I didn't mean

3 today.

4 ATTORNEY MENK:

5 --- and I can't do it

6 tomorrow.

7 MR. GATES:

8 Okay.

9 ATTORNEY MENK:

10 I mean, my schedule

11 doesn't permit that, so ---.

12 MR. GATES:

13 Okay.

14 ATTORNEY MENK:

15 I hate to make you make

16 another trip, but ---.

17 MR. GATES:

18 No, that's fine. I

19 mean I'm just curious.

20 ATTORNEY MENK:

21 And then maybe, you

22 know, depending on how much

23 you need to ask me, if there's

24 a way we can do it by phone or

25 something like that.

1 MR. GATES:

2 Okay.

3 ATTORNEY WILLIAMS:

4 Well, let's be in touch

5 and work on that.

6 MR. ZELANKO:

7 On behalf of MSHA, I

8 want to thank you for

9 appearing and answering

10 questions today. Your

11 cooperation is very important

12 to the investigation as we

13 work to determine the cause of

14 the accident.

15 We ask that you not

16 discuss your testimony with

17 any person who may have

18 already been interviewed or

19 who may be interviewed in the

20 future. This will ensure that

21 we obtain everyone's

22 independent recollection of

23 events surrounding the

24 accident. After questioning

25 other witnesses, we may call

1       you if we have any follow-up  
2       questions that we feel that we  
3       need to ask you.  If at any  
4       time you have additional  
5       information regarding the  
6       accident that you'd like to  
7       provide to us, please contact  
8       us at the contact information  
9       that we provided on Richard's  
10      card.

11     If you wish, you may  
12      now go back over any answer  
13      you have given during this  
14      interview and you may also  
15      make any statement that you  
16      would like to make at this  
17      time.  Is there anything you  
18      feel that we need to know that  
19      would be significant in  
20      getting to the root cause of  
21      this accident?

22      A.  Can I just talk with him for  
23      one second?

24     MR. ZELANKO:

25     Certainly.

1 WITNESS CONFERS WITH COUNSEL

2 ATTORNEY MENK:

3 It's certainly possible

4 that Mr. Hardy may talk about

5 some of the issues that were

6 raised with, for example, Bo,

7 and try to clarify some of the

8 questions that you asked. The

9 purpose of that would be to

10 provide you with additional

11 information by way of

12 clarification, which we may be

13 able to do.

14 And obviously, since we

15 don't get a transcript of

16 this, he has no ability to

17 review that transcript and

18 make any changes or

19 corrections or clarifications,

20 as typically would be the case

21 with a transcribed interview.

22 So, you know, if there are

23 errors in transcription or

24 something, we're not going to

25 be able to correct that,

1 unless you choose to provide  
2 us with a copy. And  
3 obviously, if we get that copy  
4 months from now, or longer,  
5 his ability to do that is  
6 going to be compromised. But  
7 again, that's your decision,  
8 not mine.

9 ATTORNEY WILLIAMS:

10 In terms of  
11 clarification, I did make  
12 notes when Doctor Hardy  
13 indicated that he could obtain  
14 some information from Bo Yu or  
15 Mr. Gilbride, and I could send  
16 you a letter just reminding  
17 you of what those areas are.  
18 And if you could provide us  
19 that information, that would  
20 be great.

21 ATTORNEY MENK:

22 And as in the past, you  
23 know, we'll certainly  
24 cooperate as best we can with  
25 trying to provide you with

1           that information.

2           ATTORNEY WILLIAMS:

3           Okay. And we

4           appreciate that.

5           A. I recognize that I will not be

6           able to answer all your questions. I

7           did not answer all the questions in

8           the written response that we gave

9           you. But, you know, I wanted to give

10          you as much as I could give you, you

11          know, in terms of knowledge of the

12          history of what we've been involved

13          in. And I appreciate your coming out

14          here, and I hope you get to the

15          bottom of this and get to the root

16          cause. You know, this is an

17          unfortunate event and we don't want

18          to repeat it.

19          MR. ZELANKO:

20          Thank you again for

21          your cooperation and your

22          time.

23          ATTORNEY WILLIAMS:

24          Let me just note on the

25          record that we skipped over

1           and did not utilize Exhibits 3  
2           or 9, so that's clear.

3                           \* \* \* \* \*

4                           STATEMENT CONCLUDED

5                           AT 2:00 P.M.

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*Richard J. Lipuma CCR*



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