RAS 2598

ShawPittman

A Law Partnership Including Professional Corporations

PAUL A. GAUKLER
202.663.8304
paul.gaukler@shawpittman.com

DOCKETED
USNRC

'01 JAN -8 A11:13

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

January 5, 2001

By Electronic Filing and Mail Delivery

Emile L. Julian
Assistant for Rulemakings and Adjudications
Rulemakings and Adjudications Staff
Office of the Secretary of the Commission
U. S. Nuclear Regulatory Commission
11555 Rockville Pike, One White Flint North
Rockville, MD 20852-2738
Attn: Docketing & Services Branch

Re: Private Fuel Storage – Docket No. 72-22 – ASLBP No. 97-732-02

Dear Mr. Julian:

I am writing in regard to our telephone conversation yesterday regarding the transcript pages of Dr. Walter Arabasz's deposition filed by Applicant in support of its Motion for Summary Disposition of Utah Contention L. You noted that two pages of Dr. Arabasz's deposition referenced in our Material Statement of Facts did not appear to be included in the transcript pages of Dr. Arabasz's deposition attached to our motion. You are correct, and we are today providing those two pages to you, to the Board, and to the parties. We have also double-checked to ensure the completeness of the other deposition excerpts provided with our Motion and have identified several pages of Dr. Bartlett's deposition which were inadvertently omitted which are also attached.

You also noted in our conversation yesterday that the cover page of Dr. Arabasz's deposition and several of the attached pages contained the phrase "Confidential and Proprietary" and you inquired whether any portion of the Arabasz deposition was confidential. I advised you that those pages were mistakenly identified as confidential and proprietary, and that no portion of the Arabasz deposition is confidential. Although you indicated that you would mark your pages as not being confidential, because we are filing additional pages, I am providing you the pages that we had originally transmitted with the caption "Confidential and Proprietary" with that phrase deleted to you, to the Board, and to the parties so that everyone can correct their copies. We have also identified that the first pages of the Allison and Solomon depositions contained the same phrase, "Confidential and

Template = SECY-018

SECY-02

Privileged," and we are providing copies without that phrase to you, to the Board, and to the parties.

Thank you for bringing these matters to my attention. Please call me if you have any further questions.

Sincerely,

Paul A. Gaukler

enclosures

cc: G. Paul Bollwerk III, Esq. (By Hand Delivery)
Dr. Jerry R. Kline (By Hand Delivery)
Dr. Peter S. Lam (By Hand Delivery)
Sherwin Turk, Esq. (By Hand Delivery)
Denise Chancellor, Esq. (By Federal Express)
Susan F. Shankman
Adjudicatory File, Atomic Safety and Licensing Board Panel
Diane Curran, Esq.
John Paul Kennedy, Esq.
Joro Walker, Esq.
Danny Quintana, Esq.

COPY OF TRANSCRIPT

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	Docket No. 72-22
	)	ASLPB No. 97-732-02-ISFSI
PRIVATE FUEL STORAGE L.L.C.	)	
	)	DEPOSITION OF:
(Private Fuel Storage Facility)	)	WALTER J. ARABASZ

Wednesday, October 18, 2000 - 9:30 a.m.

Location: Parsons, Behle & Latimer

201 S. Main, #1800

Salt Lake City, Utah

Reporter: Vicky McDaniel

Notary Public in and for the State of Utah

P R O C E E D I N G S

WALTER J. ARABASZ,

having first been duly sworn to tell the truth, was examined and testified as follows:

EXAMINATION

BY MR. GAUKLER:

Q. Good morning, Dr. Arabasz.

A. Good morning, Mr. Gaukler.

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

A. Walter Joseph Arabasz.

Q. And what is your current position and employer?

A. I'm employed by the University of Utah. I'm a research professor at the university and director of the University of Utah seismograph stations.

Q. My name is Paul Gaukler, and this morning I'm going to be asking you a series of questions with respect to Utah Contention L and related issues. If at any time you don't understand my question, will you ask me to clarify the question?

A. Yes.

Q. Are you familiar with the Private Fuel Storage project?

A. Yes, I am.

Q. And what is your familiarity with that project?

A. In August of 1998 I was asked by the director of the Utah Division of Environmental Quality if I would provide assistance in reviewing documents produced for the licensing of a facility. And in December of that year I began a contract to the university, also involving assistance of Dr. James Pechmann, to provide assistance to DEQ, the Department of Environmental Quality. And so in that process I was first given the 1997 SAR to review, and that basically began my familiarity with the project.

Q. And have you reviewed other documents related to the project?

A. Yes. Subsequently was given the Geomatrix 1999 PSHA report to review, and then was routinely given documents relating to Contention L aimed at helping the attorney general's office to respond to interrogatories and so forth.

Q. I'm going to show you just for the record a document labeled *Final Report, Fault Evaluation Study and Seismic Hazard Assessment*, Private Fuel Storage Facility, prepared for Stone & Webster Engineering Corporation, prepared by Geomatrix Consultants, Inc. Is that the report of Geomatrix that you reviewed on behalf

PSHA isn't part of Contention L. I just want it on the record as saying that.

MR. TURK: Off the record.

(Discussion off the record.)

A. In one form or another, I can recall relevant discussion in the Geomatrix report.

Q. That covers the different topics, Appendix D?

A. Correct.

MR. GAUKLER: Why don't we take a break at this point in time.

(Brief Recess.)

Q. (BY MR. GAUKLER) Dr. Arabasz, we can go back on the record now. I want to go back to a couple questions on Regulatory Guide 1.165. First of all, the nature of the studies that were outlined in Appendix D that we were discussing, would those generally be required for any type of analysis you did of seismic sources, whether you were going to use a deterministic or probabilistic approach?

A. Ideally, yes.

Q. And did you identify any of those list of studies that Geomatrix did not do?

A. No, the -- recognizing that the volcanism, the volcanic hazard was cursorily addressed in the

study, being judged to be not directly significant.

Q. And you would agree with that judgment, that it's not directly significant, volcanic hazard?

A. I am not familiar with the history of volcanic activity in this general area, and I would be reluctant to offer an opinion.

Q. Just to clarify: apart from the volcanic activity, then, they did cover everything else in Appendix D?

A. Down to the next to the last bullet, the effects of human activities, I don't recall relevant investigations. I would infer a judgment that they were basically not material.

Q. And would you agree with that judgment or disagree?

A. I'm not familiar with any history of withdrawal of fluids in that basin. In general I would agree, but I don't have that direct familiarity.

Q. Then those are the only two potential exceptions that you see with respect to Appendix D?

A. In terms of acknowledging that appropriate studies were undertaken, yes.

MR. GAUKLER: I'd like to have marked as Exhibit 3 Utah Contention L.

(Exhibit 3 marked.)

A. Yes.

Q. Could you briefly leaf through that for a second? And ask if you recognize that as the portion of the Safety Evaluation Report that you reviewed recently.

A. Yes. And as earlier indicated, I said that I cursorily reviewed this.

Q. Now, the Nuclear Regulatory Commission staff in Section 2.1.6, beginning on page 2-24, and particularly in terms of page 2-27 they talk about basic geologic and seismic information, and 2-29 they talk about regional and site geologic history, and 2-30 they talk about structural geologic conditions.

And on page 2-33 they have a paragraph called "Staff Review" with respect to this provision, and they state that "The staff reviewed the information in Section 2.61 of the Safety Analysis Report and found it acceptable because the basic geologic and seismic characteristics of the site and vicinity have been accurately described in detail to allow investigation of seismic characteristics of the Facility. The staff has determined that this information is acceptable for use in other sections of the Safety Analysis Report to develop the design bases of the Facility, perform additional safety analysis, and demonstrate compliance with regulatory requirements." And then it goes on to

state the various regulatory requirements.

Do you agree with this staff conclusion?

A. Only to the extent that it relates to my domain of inspection. I said earlier that the detail to which one attends in a site characterization depends on distance from the point of interest, in this case the site. Now, because I have not reviewed the seismic reflection data nor concerned myself with the immediate site subsurface structure on a scale that might relate to fault displacement at the site, my interest begins on a scale of kilometers from the site, kilometers below the site or kilometers away from the site. So I say yes, I agree with this, but I have to defer it to this process because the state does have companion experts who will address concerns relating to the immediate site.

Q. Can you identify anything in the staff's analysis that you disagree with?

A. In this SER?

Q. Uh-huh, in terms of that section that you just read, 2.6.1.

MS. CHANCELLOR: I'd like to object just for the record that Dr. Arabasz has already stated that he's only cursorily reviewed the report. And to the extent that you're asking for an opinion, he will give that

MR. GAUKLER: Certainly. I have no objection to that whatsoever.

(Lunch recess from 12:30 to 1:52 p.m.)

Q. Good afternoon, Dr. Arabasz.

A. Good afternoon.

Q. I'd like to have marked as Exhibit 11 a two-page document from James C. Pechmann to C. Nakahara and D. Chancellor with a cc to Dr. Arabasz dated October 20, 1999.

(Exhibit 11 marked.)

Have you seen this document before?

A. It's a copy of an e-mail. I would have seen it as an e-mail --

Q. You would have seen it --

A. -- document, correct.

Q. And this document discusses a review that Dr. Pechmann has done of the time histories --

A. Correct.

Q. -- prepared for PFS?

A. Yes.

Q. And he concludes, does he not, that the time histories appear to meet the NRC requirements?

A. That's correct.

Q. You have referred to before when I was asking about the interrogatory response on his time

COPY OF TRANSCRIPT

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	Docket No. 72-22
	)	ASLPB No. 97-732-02-ISFSI
PRIVATE FUEL STORAGE L.L.C.	)	
	)	DEPOSITION OF:
(Private Fuel Storage Facility)	)	BARRY J. SOLOMON

Wednesday, October 18, 2000 - 3:41 p.m.

Location: Parsons, Behle & Latimer

201 S. Main, #1800

Salt Lake City, Utah

Reporter: Vicky McDaniel

Notary Public in and for the State of Utah

COPY OF TRANSCRIPT

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

-oOo-

In the Matter of	)	Docket No. 72-22
	)	ASLPB No.1 97-732-02-ISFSI
PRIVATE FUEL STORAGE, L.L.C.	)	
	)	Deposition of:
(Private Fuel Storage Facility)	)	LEE ALLISON
	)	

Wednesday, October 25, 2000

Location: Parsons, Behle & Latimer
201 South Main Street, #1800
Salt Lake City, Utah

Reporter: Diana Kent, R.P.R.

Notary Public in and for the State of Utah

COPY OF TRANSCRIPT

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of:	Docket No. 72-22-ISFSI ASLBP No. 97-732-02-ISFSI
PRIVATE FUEL STORAGE, LLC	Deposition of:
(Independent Spent Fuel Storage Installation)	**DR. STEVEN F. BARTLETT** and **DR. FARHANG OSTADAN**
	Vol. I

Thursday, November 16, 2000 - 10:11 a.m.

Location: Offices of
Parsons, Behle & Latimer
201 S. Main, #1800
Salt Lake City, Utah

Reporter: Vicky McDaniel, RMR
Notary Public in and for the State of Utah

Q. Could you please go on?

A. (Dr. Bartlett) I think that's -- let's see. Got one more paragraph, don't I?

The last paragraph talks about some standard types of engineering properties tests, and it cites, for example, "unit weights, porosity, compaction, etc., which should be performed for layer 1 and 2 soils."

As I've stated earlier, I do not believe unit weights are a significant issue here. Porosity is a function of void ratio, so we're really again talking about void ratio when we say porosity. We just discussed that matter. And compaction, though I don't recall seeing standard compaction curves for this site, I would assume those would be done when one would begin to develop a design. I do not believe those type of compaction issues are a problem.

Q. Sorry, I didn't hear you.

A. (Dr. Bartlett) That any issues relating to compaction or standard compaction curves will really be an issue here.

Q. Before I ask you my next question, so the record is clear: when you said the last paragraph, you meant the last paragraph of subsection 3 --

A. (Dr. Bartlett) In that subsection, correct.

Q. -- which is on top of page 92?

A. (Dr. Bartlett) Yes, beginning with "Further, the Applicant performed only limited."

Q. Could you clarify for me what is meant in that paragraph that you just read by layer 1 and layer 2 soils?

A. (Dr. Bartlett) That I am not sure of.

Q. But you said earlier that you were not too sure of whether your definition of layers was the same as applicant's.

A. (Dr. Bartlett) That's correct.

Q. Could you elaborate on that?

A. (Dr. Bartlett) Our information and understanding of the layering of the system has changed since this document was published, and admittedly so. And as I recall in the earlier versions of the SAR we were talking about soils in the upper 30 to 35 feet and then a deeper, denser layer. And I'm assuming these mean for those -- that system. But now it seems we have progressed to the state where we've been talking about the upper layer and as many as possibly five subunits. So when it refers to layer 1 and, 2, I assume it's talking about the original layering as discussed in the SAR.

Q. But for purposes of the rest of our discussion today, when we speak of layers, do you mean

the layers that were discussed in -- strike that question. Start a new question. Were you here yesterday when Mr. Trudeau and Dr. Chang gave their testimony deposition?

A. (Dr. Bartlett) Correct.

Q. Do you recall there being a discussion in their deposition of several layers that were identified against particular figures of the SAR?

A. (Dr. Bartlett) Correct.

Q. Now, for purposes of our discussion today, when we refer to layers, are you speaking for those layers that are now currently depicted in the SAR for the top 30 feet?

A. (Dr. Bartlett) Correct. In fact, we could bring the SAR out and identify them if you'd like.

Q. We'll do that very soon, but I just wanted to make sure we're speaking of the same --

A. (Dr. Bartlett) Since this document is historical, I think it's talking about an older layering system. The layering system has evolved.

Q. Thank you. I would ask you to keep this Exhibit 3 handy, since we'll be probably talking about it a lot more.

With whom, other than your legal counsel, have you discussed issues relating to Contention L in

this proceeding?

A. (Dr. Bartlett) Of legal counsel?

Q. Apart from legal counsel.

A. (Dr. Bartlett) Oh, apart from legal counsel.

Q. Please.

A. (Dr. Bartlett) Could you restate the question?

Q. Okay. With what parties, other than the lawyers, have you discussed the subject of Contention L?

A. (Dr. Bartlett) My immediate supervisors for the Utah Department of Transportation. I've had -- I guess my supervisors now at the University of Utah have asked me questions about my involvement in Contention L. I've just told them what I'm doing, just more as in passing so they know where I'm at and what I'm about.

When you mean "besides," do you want also me to include those that are also state expert witnesses?

Q. Yes.

A. (Dr. Bartlett) Okay. That would also include, then, Dr. Lee Allison, Walter Arabasz, Jim Peschmann, Dr. Ostadan, Barry Solomon. I believe that's all.

Q. Now, what is your understanding of the respective roles of the experts that you mentioned in

this proceeding?

A. (Dr. Bartlett) We've broken it up into different disciplines and expertise for our review. And Dr. Arabasz and Dr. Peschmann have taken the lead in the Basis 1, though we have had some comments and input into Basis 1 also. When I mean "we," myself and also Dr. Ostadan.

For the geology and geotechnical issues would be Barry Solomon, Lee Allison, myself, Dr. Ostadan.

Within that trichotomy, I guess, if you will, Barry would be reviewing the geology; I would be reviewing the geotechnical engineering related to the site characterization, the foundations; Dr. Ostadan would deal with issues of dynamic loadings and dynamic analysis and response. Finished.

Q. I didn't want to cut you off. You testified earlier that you did not consult with Dr. White.

A. (Dr. Bartlett) No, I did not.

Q. To the extent that Dr. White was the person who wrote this Exhibit 3, do you believe it would be useful for you to find out what he meant, for example, here in discussion of layer 1, layer 2?

A. (Dr. Bartlett) Yes, that would have been useful.

Q. And can I ask you why you didn't speak with him?

A. (Dr. Bartlett) I was never given the opportunity as part of the team in the project.

Q. Did you seek to contact Dr. White?

A. (Dr. Bartlett) No, I did not. He was no longer retained by the state.

Q. Explain to me what you mean by you were never given the opportunity.

A. (Dr. Bartlett) Well, normally when I would consult on something of this issue in these matters, I would consult with those that would be part of the project team. He was no longer part of the team. I didn't feel it would be appropriate to seek him out once he had been removed from the team.

Q. I see. You mentioned a little while ago that your first involvement, or earlier in your involvement with this project that there was a team meeting that you attended.

A. (Dr. Bartlett) That's my first recollection of, yes, getting together with the group.

Q. What happened at that meeting?

A. (Dr. Bartlett) Well, as usual, there were some introductions. There was a fair amount of discussion about the seismic refraction, reflection

data. I remember Dr. Allison was there and discussed that to some extent. Myself being new to the team, I didn't take a large part in that, of the conversations during the meeting. Dr. Arabasz was there. I'm sure there was some discussion of the design basis ground motions, how they were being developed, derived. Denise and Connie were there. That's my recollection. It was a year and a half ago, two years ago.

Q. Have there been subsequent meetings of that time among the state experts that are working on this Contention L?

A. (Dr. Bartlett) From time to time, but usually not quite that extent. That was the first really full panel meeting that I recall.

I do recall at that time I think someone else had made the recommendations that we may consider bringing in an expert in soil dynamics at that meeting.

Q. I'm getting ahead of the story. I want to pursue that Dr. Ostadan was not part of the team then.

A. (Dr. Bartlett) You'll get him later. Fair enough. This was before Dr. Ostadan was part of the team.

Q. All right. And you said you have had less --

A. (Dr. Bartlett) Yes, not -- not I think the

questions that they had.

I think one has to also consider depth of investigation. One thing that was not done at this site is the drillings were not done down to bedrock. It's ambiguous how depth -- the depth of bedrock and types of analyses especially involve ground response -- well, at least my frame of reference is the Savannah River. We drilled several hundreds of feet down to bedrock and characterized the soil column all the way from bedrock. That was not done here, so the boreholes were all relatively shallow. We do not have real deep, or at least one or two very deep borings. So that remains an area of uncertainty to me.

There's been no -- investigations are usually phased. And in each subsequent phase you have issues that you're trying to resolve and what you're trying to do in those, and I'm not sure I get a sense in reading the documentation why some things were being done and why they were doing additional borings and investigations, other than just to satisfy a few questions from the NRC.

Q. With respect to your observation that the borings and the cone penetration tests are often or sometimes too far apart to be able to correlate the data, what is the significance of the fact that you

might not be able to correlate the data as you would like to?

A. (Dr. Bartlett) Well, we saw yesterday that cone penetrometer data were used to adjust the shear strengths for layer 4, and if you get too far apart between the data which you're trying to adjust, your adjustment factors may be meaningless.

Q. You're saying, if I understand you, and correct me if I'm wrong, that to the extent that you want to be able to refer to cone penetration test data, to adjust some of the information that you get from the boring data --

MS. CHANCELLOR: Objection. Is this a question?

MR. TRAVIESO-DIAZ: Yes. I'm getting there.

Q. (By Mr. Travieso-Diaz) You might not be able to do so because the two sets of measurements are too far apart?

A. (Dr. Bartlett) Yes, correct. Because there's lateral variability in this direction, and the further you get apart, the less the data are correlated. So you run the risk of essentially developing correlations upon which there are no -- they don't correlate. So in other words, part of your distance that you space boreholes, whether they be CPT or SPT, is

fundamentally based on your understanding of how much you think the soils are variable, particularly in the lateral direction.

Q. So I take it that to the extent that this presents a problem, it's only if you're trying to correlate for some reason to assess the data. Is that fair?

A. (Dr. Bartlett) I may have to think about that. I'll answer this way. Yes, if your main premise or what you're trying do in an investigation is correlation. To me, it's obvious that they have to be very close or reasonably close. If you're using the two types of data to supplement one another, I can see cases where they would not necessarily have to be in close proximity to each other. However, one then has to go back and consider the density of both types of data, because they are different types of data, and whether you're putting in the appropriate number of borings and sampling to fully characterize the site.

Q. How many cone penetration tests in your practice do you typically correlate to a single boring? Is there any ratio or any way you correlated the measurements?

A. (Dr. Bartlett) If I'm trying to correlate?

Q. Yeah.

A. (Dr. Bartlett) So you're asking how many paired boreholes, CPT and boreholes would I do in an investigation to develop correlations?

Q. Yes. One to one? One to two? I don't know. I'm trying to get a sense for how you do the correlation.

A. (Dr. Bartlett) Well, let's see if this answers your question. If my purpose is correlating data from a borehole, I would always have a CPT adjacent to it.

Q. And to the extent that you are trying to correlate cone penetration tests and boreholes, typically how many of those do you do?

A. (Dr. Bartlett) It depends on the size of the facility. So there's a density issue now; how many data do I need. And different agencies, whomever you're working for, have different somewhat suggestions. I won't call them requirements. It's usually still left up to the discretion. But they have densities that they suggest to you.

Q. Is there any -- talking about agency requirements, is there any NRC guidance or regulations that control the spacing of the placement of boreholes?

A. (Dr. Bartlett) Yes, they are.

Q. Where would those be?

A. (Dr. Bartlett) I believe they are found in Reg Guide 1.132, Appendix C, I believe.

Q. Did you review Appendix C or Reg Guide 1.132 to determine whether the program that was put in place at PFS comply with the requirements of that appendix?

A. (Dr. Bartlett) Yes, I did.

Q. And what was your conclusion?

A. (Dr. Bartlett) They did not.

Q. In which respect?

A. (Dr. Bartlett) There were not enough boreholes. May I qualify that?

Q. Okay.

A. (Dr. Bartlett) For the pad emplacement area. I'm not sure I would make that statement about the canister transfer building right now. I'd have to, again, look at the -- count the borings again in that footprint.

Q. So you're not sure?

A. (Dr. Bartlett) Right. And the reason I'm not sure is because when we divide -- when we split this project team up to do the review, I really primarily looked at the storage pad -- or emplacement pad area, excuse me, and Dr. Ostadan looked more at the canister transfer building. However, I have looked at the laboratory testing and boreholes from both areas.

Q. May I refer to Dr. Ostadan. Don't think I'm forgetting you. In your review of the canister transfer building, did you develop a view as to whether the number of boreholes that were drilled or that were done by PFS complies with Reg Guide 1.132?

A. (Dr. Ostadan) I did not specifically review the investigation performed for the canister transfer building to see whether it's in compliance with the NRC guidelines or not.

Q. Okay. Let's move to something else.

A. (Dr. Bartlett) Sure.

Q. I take it, as we discussed before, that one of the purposes of drilling boreholes is to take samples for later testing in the laboratory?

A. (Dr. Bartlett) Yes.

Q. And I take it that you have in fact gone through the process of first collecting samples and then having tested them or having them tested?

A. (Dr. Bartlett) Generally having them tested, because most of my commercial experience we did not have our own on-site laboratories. Those were sent to either others in the firm or laboratories which we were contracted with. But yes, I have taken samples to submit them for laboratory testing.

Q. What kinds of tests are typically run with

soil samples taken from projects such as the ones you have been involved with?

A. (Dr. Bartlett) What types of tests or samples?

Q. No. No. What type of tests are conducted in the laboratory with respect to samples taken from borings?

A. (Dr. Bartlett) Shear strength tests, consolidation tests, general Atterberg and classification tests. Once in a while permeability testing.

Q. Has, to your knowledge, applicant performed tests on samples taken from borings on the PFS site?

A. (Dr. Bartlett) Yes, they have.

Q. What kind of tests did they run?

A. (Dr. Bartlett) Regarding shear strength, to my knowledge, they've performed unconsolidated-undrained, UU tests; consolidated-undrained; direct shear. I believe that's all I recall as far as shear strength testing. Consolidation testing, and the oedometer, o-e-d-o-m-e-t-e-r. And then again typical classification tests that we would do -- moisture contents, Atterberg limits, those type of routine tests.

Q. In terms of the kinds of tests that the applicant performed, was there any category of tests

that they failed to perform that you wish they had?

A. (Dr. Bartlett) Restricting ourselves to laboratory testing, correct?

Q. Yes, restricting ourselves to laboratory testing for the moment.

A. (Dr. Bartlett) Okay. Yeah, I think a direct simple shear test. Some of that might be useful instead of the direct shear. Also strain controlled triaxial testing, cyclic triaxial testing.

Q. Why do you feel that they should have done strain controlled triaxial tests?

A. (Dr. Bartlett) We have issues with degradation, degrading of the strength and modulus of some of these soils at the level of strains that we see that have been produced by the earthquake. And really we cannot assess whether those degradations are real or not, because the type of testing they perform doesn't really lead us any. They performed --

I'm not sure quite what I said. Can I start again?

Q. Sure.

A. (Dr. Bartlett) Okay. Let me focus on first the direct simple shear test.

Q. Okay.

A. (Dr. Bartlett) The direct simple shear test

does not allow really any strain concentrations along one predefined plane. So it may give us a better indication of what the shear strength is across the entire sample. The direct shear test which was performed by the applicant tends to concentrate stresses on one predefined failure plane.

Now on to the strain controlled cyclic triaxial tests. Those would give us a better idea, or an idea, really, of how the stiffness or modulus and the strength may degrade or behave at the levels of strain that we see from the shake analysis.

A. (Dr. Ostadan) May I add to that?

Q. Yes, please.

A. (Dr. Ostadan) One of the points raised in Contention L was the soil properties used to take into account soil linearity or the so-called soil curves or generic curves. I have not seen in the package, in the calculation any laboratory data that was developed in order to come out with the site specific soil curves.

Q. Let me clarify your answer to make sure that you're saying what I understand you to be saying. Are you saying, Dr. Ostadan, that there is no data developed in the laboratory for specific soil properties for the PFS site?

A. (Dr. Ostadan) No, I'm not saying that.

Q. Or are you restricting yourself to a particular type of soil test?

A. (Dr. Ostadan) I'm restricting myself to a particular soil test. You asked -- your question was, what other tests should have been done in the laboratory. And my answer to that, in addition to what Dr. Bartlett said, is that cyclic triaxial tests could have been done to develop site specific soil curves as is stated in the Contention L.

Q. Is it your testimony that they did not conduct cyclic triaxial tests?

A. (Dr. Ostadan) They did not conduct cyclic triaxial tests to develop soil curves.

Q. I need you to explain the second part of the answer. What do you mean by "to develop soil curves"?

A. (Dr. Ostadan) Soil curves are used primarily in a ground response analysis, such as those done by the applicant here using computer program Shake, S-h-a-k-e. As shown in the calculation currently, the curves are generic curves, published in the literature.

Q. When you say that they should have run cyclic triaxial tests to develop soil curves, what would those curves be? Of what? In other words, how would you be plotting the curves?

A. (Dr. Ostadan) The curve have two branches,

actually. There are two types of information present in these curves. One is shear modulus of the soil and the function of shear strength, and it's in a linear curve that shows degradation of the stiffness versus the strain.

The second piece of the information is the soil material damping as a function of shear strength that generally shows an increase of damping versus strain.

Q. And your testimony is that these type of tests for the purpose of developing this type of curves were not done?

A. (Dr. Ostadan) Yes.

A. (Dr. Bartlett) May I add to my testimony?

Q. Please.

A. (Dr. Bartlett) One other test that we discussed a little bit yesterday is the types of triaxial testing that were done were all in compression. I believe also in helping to understand maybe the part of the failure surface that we look at when we look at general bearing capacity that's in -- it actually goes into extension. So the triaxial extension test too would appear to be appropriate for parts of that failure surface.

Q. So your testimony is that in addition to the

triaxial tests that they did in compression --

A. (Dr. Bartlett) Right.

Q. -- they should have done a similar test that was in extension as opposed to compression?

A. (Dr. Bartlett) Correct. And I would also add that we would -- we see a conceptual design of a soil mat that we need to also, instead of seeing compression of that soil cement, we also need to understand its behavior and tension. So we need tensile tests done on the proposed design of this soil cement mat.

Q. Let me ask you the following question. The simple shear test that you mentioned before, are these commonly performed in the industry? And we're talking about any of these tests, starting with the simple shear tests, specialized tests.

A. (Dr. Bartlett) The direct simple shear test, I'm not sure I could call it specialized, but it may be hard to find from a small commercial geotechnical laboratory. Larger laboratories in a fair amount of universities can perform these type of tests.

Q. Have you done any of these yourself in your program?

A. (Dr. Bartlett) I have not.

Q. How about the triaxial extension tests or

presented. I can infer their thicknesses from this and somewhat about significant features that the geologists mapped in their trenches, namely, fractures, in-field fractures. Seems that they were most interested in obtaining the strike and dip or the orientation of those, and then they did a rose diagram to figure out if there was any preferential orientation to this data. That's what I see.

Q. Now, let's go back again just so we can move to the bottom line. We were talking about the sentence in Exhibit 3 that said, "Structure specific cross sections and profiles were not prepared utilizing the boring log records." And you said that that is a true statement. And my question to you is, in light of all the information that I just displayed before you, does it matter? Or how does it matter? Is this a significant concern?

A. (Dr. Bartlett) When this Contention was written, structure specific cross-sections and profiles were not prepared using the boring logs or from the boring logs that were obtained during the first phase of the investigation. This Geomatrix report postdates that, postdates this statement; and whether structure-specific cross-section profiles were not prepared using the boring logs from the current data as

it now exists, including the CPT and the borings done by Geomatrix, the shallow borings we see, I'm going to defer whether we've really met that or not, because again, we're in the realm of geology and that's really outside of my review.

Q. Okay. I'm trying to understand, to what extent did you personally regard this statement here in Contention L?

A. (Dr. Bartlett) I did not draft this statement.

Q. I understand, but it's on the record now. I'm trying to get your interpretation as to how significant you considered this observation to be.

MS. CHANCELLOR: Objection. He already said he's deferred to somebody else.

MR. TRAVIESO-DIAZ: I'm asking for his opinion if he has one.

A. (Dr. Bartlett) I think that along the lines of where the trenches were investigated, these seem to be reasonable and consistent types of data and presentation of them. Whether all borehole data including the geotechnical and geological investigations have been compiled and reconciled in site-specific structural cross-sections, I don't see that all here, but again, I haven't reviewed this report.

Q. Well, assuming this statement is still true today, does it concern you? Is it something that causes you concern as to the state of the investigation of the site performed by PFS?

A. (Dr. Bartlett) Probably not from a geotechnical perspective, but geologists have other reasons for wanting to know the orientation of these layers, which could infer dips, faults and other things. And so there -- these are not geotechnical cross-sections, they are geological cross-sections. I'm going to defer from trying to really say whether I -- what was the question? I'm not sure I'm answering it.

Q. Okay. I only want to know, since you are the person who's explaining to us this contention, whether you personally have a concern with this particular observation made in this paragraph. That's all I want to know.

A. (Dr. Bartlett) I personally don't have a concern. Others may on the team.

Q. All right. And others will be who?

A. (Dr. Bartlett) Barry Solomon, that prepared part of this document.

Q. All right. Let's move to the next sentence on that page. It says, "Only a generalization of the boring logs were used to establish the site geologic

characterization." Do you believe that statement to be correct today?

A. (Dr. Bartlett) I think what it means, a generalization of the boring logs was used to establish the site geological characterization. Again, since the words "site geological characterization," I'm going to defer.

Q. Do you know whether it was true at the time it was written, was accurate at the time it was written?

MS. CHANCELLOR: Objection. You're asking him to speculate about --

MR. TRAVIESO-DIAZ: If he doesn't know, he can say easily, "I don't know."

A. (Dr. Bartlett) I don't know if it was true. I don't know if --

Q. Do you know if it's true today?

A. (Dr. Bartlett) I do not know if it's true today. Again, the answer I think would be in the Geomatrix report to that question, and I have not reviewed it.

Q. Would you believe that these two statements would relate more as you're talking about the geology of the site as opposed to --

A. (Dr. Bartlett) Geotechnical.

Q. -- geotechnical issues?

A. (Dr. Bartlett) It seems to me that these are more geological, not geotechnical issues, yes.

Q. Do you understand that the scope of Issue 3 to be addressing geotechnical issues?

A. (Dr. Bartlett) Could you repeat the question?

MR. TRAVIESO-DIAZ: Could you read it back?

(The pending question was read.)

A. (Dr. Bartlett) Issue 3?

Q. Yes, what we have begun to look at, discussion on page 83 of Exhibit 3.

A. (Dr. Bartlett) I don't see, at least in the description of 3, geological or geotechnical used.

Q. All right.

A. (Dr. Bartlett) But in 3a, where they start referring to the sections, the words "geological" are used.

Q. All right.

A. (Dr. Bartlett) That's what I see.

Q. Let's go to -- I'm sorry. I didn't mean to interrupt you. Let's go to the next sentence of this paragraph that starts on the bottom of page 83, goes up to the top of page 84.

A. (Dr. Bartlett) Fair enough.

Q. It says, "It is not possible to ascertain

whether or not all of the data collected, particularly data on zones of soft/loose conditions encountered in the explorations, have been used to characterize subsurface conditions and to establish design values."

Let me stop there for a moment. Is that statement that I just read you, this portion of the sentence, true today?

A. (Dr. Bartlett) I have a hard time interpreting whether the sentence is true without completing the sentence.

Q. The reason I stopped is because I believe that what follows, you already told us that was resolved. The sentence that starts after the "and," or the clause that starts after the "and." So that's why I stopped. You can read the whole sentence if you will.

A. (Dr. Bartlett) Fair enough. If I could do that. I forgot that part, so...

Q. I'm sorry. That's where I stopped.

A. (Dr. Bartlett) I do not agree with your interpretation that everything that -- in the second half of that sentence that we have agreed that we are not concerned about.

Q. Okay. In what respect do you believe that it is not possible to ascertain?

A. (Dr. Bartlett) My characterization this

morning, as I recall it, and I underlined this in pencil, so that's why I am going back to that, is that we -- it talks about uncertainties with the estimation of the thickness. And I agreed that I -- from these cone penetrometer data that there's not a great uncertainty in the estimation of thickness. But this sentence also talks about "and to establish design values." And so inasmuch as we're talking only about estimation of thicknesses of design value, I do not see any significant issues.

MR. TRAVIESO-DIAZ: Could you read the answer back again? I don't think I followed it entirely.

(The record was read.)

Q. (By Mr. Travieso-Diaz) Are you saying that you still believe that it is not possible to ascertain whether or not all data collected has been used to establish design values? Is that the part you have a problem with?

A. (Dr. Bartlett) I'm sorry.

MR. TRAVIESO-DIAZ: I'm sorry. I think I got it right, but could you read it?

(The pending question was read.)

Q. (By Mr. Travieso-Diaz) Can I rephrase the question?

A. (Dr. Bartlett) Yes, please. I'm having a hard time with it.

Q. If I understood your last answer, you said that to the extent that we're talking about the characterization of subsurface conditions, you don't have a problem that all data collected have been used to do that. But you are restricting yourself to that, and I presume that you meant that with respect to the use of those data to establish design values, you may still have a problem or a concern. Is that fair?

A. (Dr. Bartlett) What I am stating is that thickness is a design value. We use it in calculations of settlements and other things. And inasmuch as thickness is a design value, the data that we have seem to be sufficient to estimate the thickness of the sediments, and I think I restricted that this morning in the upper 30 to 35 feet where the cone penetrometer data were collected. There are some uncertainties of thicknesses of layers deeper in the profile.

Q. I think I understand now. Thank you very much.

Let's go to -- would you like to take a break now?

A. (Dr. Bartlett) Your call. Yeah, it might be good for just a few minutes.

(Recess from 4:31 to 4:42 p.m.)

Q. (By Mr. Travieso-Diaz) Before the break you mentioned something, I don't recall the precise words, to the effect that the boundary, the actual boundary between the layers was of some significance or some interest?

A. (Dr. Bartlett) The thickness.

Q. Of the layers?

A. (Dr. Bartlett) Of the layers is a design value, because we have to use it in settlement calculations. We're also inferring how continuous in the vertical direction might be properties because those layers. So it is a design value, at least in the upper profile where the cone penetrometer's been taken. From a geotechnical viewpoint, the estimation of thickness throughout this pad emplacement area and the canister transfer building do not seem to be significant issues, but only with regard to the thickness.

Q. All right. Let me show you another exhibit here.

(Exhibit 56 marked.)

I'm showing you what has been marked as Exhibit 56.

A. (Dr. Bartlett) Correct.

Q. And I will identify it for the record as

being Section 2.6.1.12.1 of the SAR, entitled "Stability and Settlement Analyses--Cask Storage Pads." This section -- this exhibit goes from pages 2.6-46 to 2.6-54 of the SAR. And for the moment I'm going to ask you to look at page 2.6-49 and to the last paragraph on that page. Do you see that paragraph?

A. (Dr. Bartlett) Beginning with "analyses"?

Q. Exactly, yes. You have that.

A. (Dr. Bartlett) Yes.

Q. As I read this paragraph, it appears to say that in performing bearing capacity analysis, the applicant assumed that the top 30 feet of subsurface soil was uniform, and assigned to that layer the minimal value of strength measured in the tests that were taken on depths -- that were performed on samples obtained from depths of approximately 10 to 12 feet. Do you see that?

A. (Dr. Bartlett) Yes, the UU test. I see that.

Q. Correct. Is it your understanding that in fact based on this sentence and of what Mr. Trudeau testified yesterday, that that is what the applicant did?

A. (Dr. Bartlett) They used a minimum value of the UU test with an undrained shear strength of 2.2 ksf.

That's the best of my recollection. We can review the calculation, but I don't think it's necessary.

Q. Assuming that in fact that is what they did, would any concerns as to whether the boundary between the various layers that are comprised in the upper 30 feet have any significance, at least insofar as this calculation is concerned?

A. (Dr. Bartlett) I don't understand the question.

Q. All right. This is what I understand applicant did. They measured strength in the layer from locations of depths of approximately 10 to 12 feet.

A. (Dr. Bartlett) Correct.

Q. And they selected the minimum value of strength that was shown by those tests.

A. (Dr. Bartlett) Correct.

Q. It's reported here as 2.2 thousand pounds per square feet.

A. (Dr. Bartlett) Correct.

Q. And they used that as the presumed strength of the entire top 30 feet of subsoil. Is that what they did?

A. (Dr. Bartlett) That's apparently what they did.

Q. All right. And assuming that's what they

did, would that choice of design parameters resolve or address any concerns there might be with respect to what the thickness or the location or the layers that are comprised in the upper 30 feet would be?

Do you understand the question?

A. (Dr. Bartlett) No.

Q. Okay. Let me ask the question differently. Assuming that they picked the lowest value of strength that was available and what was perceived as being the least strong layer --

A. (Dr. Bartlett) Okay.

Q. -- okay? And they used that as their design value of strength in their analysis of bearing capacity.

A. (Dr. Bartlett) Okay.

Q. Assuming they did that.

A. (Dr. Bartlett) Uh-huh.

Q. Would that choice, that decision, resolve any concerns there might be, at least with respect to that calculation, as to what the relative locations or the various layers comprised the 30 feet would be? Do you care whether one layer is five feet or six feet or seven feet if you're going to take the lowest value and use it for all three?

A. (Dr. Bartlett) Let me interpret what I read here.

Q. Okay.

A. (Dr. Bartlett) That a sample was taken approximately 10 to 12 feet, presumably in layer 2. We must be careful when we look at that 10- to 12-foot depth to make sure that that was layer 2. Because it's my recollection layer 2 can sometimes end as shallow as eight feet. So there's a little bit of uncertainty of whether this exactly came from layer 2. So we first need to ascertain that.

Then it's the minimum value coming from a set of UU tests where the state has always contended that the quantity and number of triaxial testing done in this area has been insufficient for a design facility of this size. I cannot tell whether it is the minimum value in layer 2. I have insufficient data to determine whether it's the minimum, maximum, mean, or if it even is actually from layer 2.

Q. All right. So -- and this becomes a hypothetical question because you don't have the answers to all these items that you said. But assuming hypothetically that the lowest value that was in fact measured in this upper 30 feet corresponded to the measurements of 10 to 12 feet and was this value 2.2, with those assumptions, assuming the things that you don't have to assume because you don't know --

MS. CHANCELLOR: I'm going to object. This is going to call for lots of speculation.

MR. TRAVIESO-DIAZ: Well, I would ask him -- I would like him to answer if he can.

Q. (By Mr. Travieso-Diaz) Assuming -- with those assumptions, would that design choice obviate the concern that you may have defined your layers not completely accurate?

A. (Dr. Bartlett) No. Because we discussed yesterday that even if we assume that the 2.2 ksf represents the minimum value for this layer and that we assume that the minimum is of layer 2, we talked about yesterday that there are still free field ground motions that have to be resisted by this particular structure and that some of this 2.2 ksf capacity will not be available, the full capacity will not be able to resist the motions of the structure. And we still have issues with this value even at 2.2 ksf.

Q. All right. Okay.

A. (Dr. Bartlett) Do you want to add to that, Dr. Ostadan?

A. (Dr. Ostadan) Yes. I think -- just a reminder, you discussed anisotropy and some cone penetrometer testing, and whether the shear strength under extension would be different or not.

A. (Dr. Bartlett) Yes, I remember now. Also an additional issue is the types of testing done were triaxial compression, and we've talked this morning and somewhat yesterday in our line of questioning about the need to consider anisotropy and that this 2.2 ksf may not represent the average shear strength mobilized along the failure plane.

Q. All right. Let's move to the first full paragraph -- first sentence in the first full paragraph of page 84 of Exhibit 3.

A. (Dr. Bartlett) Excuse me. Did we finish our discussion of the last sentence on 83? I don't recall.

Q. I believe so, because you talked about the first half of the sentence, and you have told me earlier in the day that the second half, having estimated the thickness, was no longer a concern.

A. (Dr. Bartlett) Yes. And restricted it to thickness, yes.

Q. So that's why I believe we have finished that section. So let's just move to the next one that says that -- I'm going to paraphrase it slightly -- that the SAR section 2.6 defining geologic features is not acceptable because the discussions, maps, profiles of the site stratigraphy, structural geology, geologic

history, and engineering geology are not complete and are not supported by investigations sufficiently detailed to obtain an unambiguous representation of the site geology.

Now, do you believe that sentence that I read you to be correct today?

A. (Dr. Bartlett) That's beyond my expertise and scope of review.

Q. Based on your expertise, is there any portion of that sentence that you believe to be correct today?

MS. CHANCELLOR: Objection. He already testified it's beyond his scope.

Q. From where you sit as the designated expert on this Issue 3, would that, the matters raised in that sentence, if true, be of certain to you?

A. (Dr. Bartlett) If they were true, they would be a concern to me.

Q. How would they be a concern to you?

A. (Dr. Bartlett) One must understand the geology of a site in performing the interpretation of what has occurred and the geological processes that have acted upon this site.

Q. All right. And you don't know in fact whether this assertion is still true. Is that correct?

A. (Dr. Bartlett) Right.

Q. All right. Now, the next sentence says, "The maps do not provide the requisite detail to evaluate the assumed geologic conditions stated in the text." First of all, can you help me, tell me what maps are being described here?

A. (Dr. Bartlett) Well, again, with using the adjective "geologic," I assume it would be referring to geologic maps.

Q. What would be -- what would geologic maps be?

A. (Dr. Bartlett) Mapping of the surficial geologic units.

Q. And do you know the extent to which those maps have been prepared since SAR -- since this contention was written?

A. (Dr. Bartlett) I have not reviewed those maps.

Q. All right. So you have no knowledge as to this particular sentence?

A. (Dr. Bartlett) That's correct.

Q. Assuming this sentence was correct, would it present a concern to you?

A. (Dr. Bartlett) Geologic maps can be used to interpret features, for example, faults or surficial

geological features that could have implications and interest to the past history and potential future history of this site.

Q. Now, I'm going to ask you to read the next two sentences together, because I believe that -- and correct me, but I believe you need to read them together. The first sentence says, "The maps do not provide the requisite detail to evaluate the assumed geological conditions stated in the text." And then the next sentence says, "For example, only 25 borings were taken across the site, and from this a single generalized geologic profile in an obtuse angle across the canister fuel storage facility is presented." And the citation is given to SAR Figure 2.6-5.

A. (Dr. Bartlett) Correct.

Q. You see that?

A. (Dr. Bartlett) Yes, I do.

Q. Here's my problem.

A. (Dr. Bartlett) I see your problem.

Q. SAR Figure 2.6-5 I do not believe is a geologic map, is it?

A. (Dr. Bartlett) It's probably a profile, I would assume.

Q. In fact, let's just not assume. Let's take a look at -- never assume when you can prove. Let's

take a look at Exhibit 51, and let's take a look at Figure 2.6-5, which is the third figure on the page.

A. (Dr. Bartlett) I see it.

Q. Okay. Does that look like a geologic map to you?

A. (Dr. Bartlett) No, that's a geotechnical cross-section.

Q. Right. And in fact, if now we look at the same Figure 2.6-5 as it sits today, it's 17 maps; is that correct? Or 14 and three maps.

A. (Dr. Bartlett) What I sense is happening here in this is that the geologist reviewed the original SAR and did not find the data that they needed to make their geological interpretations off of what is truly a geotechnical profile.

Q. All right. But what my concern is, are we talking here about a geological concern or a geotechnical concern? To the extent that he's talking about SAR Figure 2.6-5, that would indicate to me that he's talking about geotechnical, not a geological concern.

A. (Dr. Bartlett) And again, it may have been the only profile presented in the original SAR, and so it was perceived as both a geotechnical and a geological cross-section because it did show some type of layering.

Q. All right. When it says here that "a single generalized geologic profile in an obtuse angle across the canister fuel storage facility is presented," can you go back again -- I'm sorry to keep going back to it, but let's go back again to that Figure 2.6-5.

A. (Dr. Bartlett) Sure.

Q. It's defined as Foundation Profile A-A' Looking Northeast, and if you will correlate for me perhaps with Figure 2.6-2 from the same exhibit.

A. (Dr. Bartlett) I see it, okay. The cross-sectional line, I see it.

Q. All right. Is the line A-A' on 2.6-2 at an obtuse angle? Is that what he's talking about?

A. (Dr. Bartlett) I believe so. On an angle that's not perpendicular or parallel to the main -- to the building.

Q. Assuming that that's what he's talking about, that he's concerned there's only one of these lines, isn't it true that you now have, just for the pad emplacement area, 14, and there are two diagonal cuts and like half of those go east/west and half of those go north/south?

A. (Dr. Bartlett) Correct. Those are geotechnical cross-sections.

Q. Well, what I'm trying to understand, and

maybe you can help me, whether this concern now is still viable in light of all the additional information that we have.

A. (Dr. Bartlett) This, by using the term "generalized geological profile," to a geotechnical profile.

Q. Okay. If the wording of this particular sentence was changed from geologic to geotechnical profile, would you believe it's accurate today?

A. (Dr. Bartlett) In the extent that we've discussed our feelings of adequacy and inadequacy of the geotechnical profiles in this area, which we've had conversations, we've discussed those. Whether those same cross-sections meet the needs for a geological interpretation, I will not interpret that.

Q. From your standpoint, would those be sufficient?

A. (Dr. Bartlett) They may not be. They're geotechnical data, primarily, not geological data.

Q. But from a geotechnical standpoint, would they be sufficient?

A. (Dr. Bartlett) The cross-sections of the test?

Q. Yeah.

A. (Dr. Bartlett) We've discussed about their

adequacy, about delineating the stratigraphy in the upper five layers.

Q. Right, thirty feet.

A. (Dr. Bartlett) We've discussed some inadequacies we see even in the geotechnical perspective with depth.

Q. Below the top 30 feet?

A. (Dr. Bartlett) Yes, below the cone penetrometer data, CPT data.

Q. All right. And let's move on to the next sentence, that says, and I read, "The geologic profile cannot be correlated with surface topography, geological deposition soil characteristics, or seismic profiling completed for the site." Do you know whether that is an accurate statement today?

A. (Dr. Bartlett) Again, it uses the word "geological profile"; and inasmuch as I haven't really reviewed the main geological report for this site, which is the Geomatrix report, I defer from really answering any of those.

Q. And again, as you sit here today, would you consider this to be a concern to you?

A. (Dr. Bartlett) If one cannot correlate surface topography, geological deposition, soil characteristics, and deeper seismic profiling for the

site, it would be difficult to develop cross-sections that would show significant geological features, and those missing details could be important to this site.

Q. Okay. But to you is this a concern?

A. (Dr. Bartlett) From a geotechnical perspective?

Q. Yes.

A. (Dr. Bartlett) I'm not understanding that question. This is discussing geological data.

Q. Correct. I understand that you're not testifying as to what a geologist's concern might be with this statement. But as a geotechnical expert, would this statement in itself pose a concern to you?

A. (Dr. Bartlett) Yes. It might infer also, particularly with a couple aspects regarding seismic profiling, we also need some of those same types of data to develop shear wave velocity models. And so if those were incomplete, we would have difficulty also completing our analyses and characterizations.

It mentions soil characteristics. And even though -- if those soil characteristics are geotechnical, then I am concerned that they're -- that we need to better quantify the soil characteristics.

Q. Well, you would not turn to the geological profile to do that, would you?

A. (Dr. Bartlett) You bet I would.

Q. I thought you would be looking at the geotechnical profiles that we were looking at before.

A. (Dr. Bartlett) I'm also trained as a geologist, and I always look at a geological profile before I start my geotechnical investigations.

Q. Oh, so you have expertise in geology?

A. (Dr. Bartlett) I have a degree in geology.

Q. I see.

A. (Dr. Bartlett) But I am not the state's expert on that Geomatrix report.

Q. So your deferring on geology questions is not based on lack of knowledge, but it not your assumed role in this --

A. (Dr. Bartlett) I've practice as a geotechnical engineer for most of my profession. My geological skills are still there, but a little bit distant.

Q. Maybe you can help me, then, on the next sentence that says, "Details missing include the interrelationship of the subsurface conditions with the geologic history of the site." Would you just translate that for me and tell me what it means?

A. (Dr. Bartlett) I think what this is trying to do is establish the interrelationship of the

subsurface conditions and the profiles or cross-sections we talked about with the geological history: what are the geological origins of those units, what are their ages, how were they deposited, what are their characteristics from a geological perspective.

Q. To ask the question differently, would this mean a correlation with a particular subsoil level and the time in geological history in which that level was deposited?

A. (Dr. Bartlett) That's part of it, but it means more than that.

Q. What else does it mean?

A. (Dr. Bartlett) Could mean its physical characteristics. Could mean any anomalies or differences or subtle difference in this layering. Could mean also -- since it's a general term, subsurface conditions, it could mean faulting and fracturing or issues related to potential instability that's been recorded in the geological history of these sediments. It means many things.

Q. All right. Let's go back and take a look at Exhibit 50. I'm sorry, I didn't mean to cut you off. Are you finished?

A. (Dr. Bartlett) No, no. That's enough.

Q. Let's take a look at Exhibit 55. Black and

The applicant disagrees with the state with respect to whether foundation loading is contained in Basis 3, and we have agreed to disagree.

Is that a correct statement?

MR. TRAVIESO-DIAZ: That's a fair, correct statement. However, I would like you to add also that you do not anticipate that Dr. Ostadan will be testifying with respect to Basis 4.

MS. CHANCELLOR: Oh, that's correct. I'm sorry. I thought that I did that. No, Dr. Ostadan will not be testifying with respect to the -- the caption to Basis 4 is "Soil stability and foundation loading." Dr. Ostadan will be testifying with respect to foundation loading, but the text of Basis 4 does not address foundation loading.

MR. TRAVIESO-DIAZ: Will you stipulate that he will not present testimony on Basis 4?

MS. CHANCELLOR: Provided that foundation loading, you don't say that foundation loading is precluded because it's in the caption of Basis 4.

MR. TRAVIESO-DIAZ: I will stipulate that to the extent there is any foundation loading issue admitted into this, the litigation of this contention will be part of Basis 3.

MS. CHANCELLOR: So stipulated.

sentence, which is the last complete sentence on page 88 that indicates, "How samples are prepared and tests performed can significantly impact test results and their interpretation, potentially making the test results and interpretations meaningless." I take this sentence just to be caution as to what may happen if you don't do --

A. The right type of testing to solve the type of issues that are at hand, or if your type of testing program does not consider the type of loading that's going to be imparted to the soils. You can perform a test, but if it is outside the bounds of the loading that's anticipated, then the test results are meaningless. Well, I won't say meaningless to you, but they're not as valuable.

Q. Would it be fair to say that this sentence is a general description of why it's important to do the sample testing the right way as opposed to bringing up particular problems? In other words, is this a general sentence without any specific issues being raised by it?

A. Right. I think it's a general sentence, and I think through the last three days of testimony we've already discussed specific issues and how to make the testing more meaningful.

MS. CHANDLER: Could we just go off the