MEETING

STATE OF CALIFORNIA

AIR RESOURCES BOARD

SCIENTIFIC REVIEW PANEL

SOUTH SAN FRANCISCO CONFERENCE CENTER

BADEN ROOM

255 SOUTH AIRPORT BOULEVARD

SOUTH SAN FRANCISCO, CALIFORNIA

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JAMES F. PETERS, CSR, RPR
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APPEARANCES

PANEL MEMBERS

Dr. John Froines, Chairperson

Dr. Roger Atkinson

Dr. Paul Blanc

Dr. Craig Byus

Dr. Gary Friedman

Dr. Stanton Glantz

Dr. Katharine Hammond

Dr. Joseph Landolph

REPRESENTING THE AIR RESOURCES BOARD:

Mr. Jim Behrmann, Liaison, SRP

Ms. Janette Brooks, Chief, Air Quality Measures Branch

Mr. Peter Mathews

REPRESENTING THE OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT:

Dr. George Alexeeff, Deputy Director

Ms. Sara Hoover, Research Scientist

Dr. Melanie Marty, Manager, Air Toxicology and Epidemiology Section

Dr. Andrew G. Salmon, Chief, Air Toxicology and Risk Assessment Unit

Ms. Martha Sandy, Supervisor, Cancer Toxicology and Epidemiology Section

APPEARANCES CONTINUED

REPRESENTING THE DEPARTMENT OF PESTICIDE REGULATION:

Ms. Tobi L. Jones, Assistant Director

Dr. Lori Lim, Staff Toxicologist

Mr. Randy Segawa, Senior Environmental Research Scientist

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PROCEEDINGS

CHAIRPERSON FROINES: So we will officially convene the meeting of the Scientific Review Panel on December 13th, 2005.

And the first topic on the agenda is going to be the sulfuryl fluoride findings.

And, Tobi, you may not have much to be involved with because it's going to be internal pretty much to the Panel, unless you had some comments at the beginning.

DPR ASSISTANT DIRECTOR JONES: And this is Tobi Jones, Department of Pesticide Regulation.

I only wanted to introduce Lori Lim and Randy Segawa, who are joining us by phone, should you have any specific questions about the risk assessment or your findings.

CHAIRPERSON FROINES: And they are on the phone.

They can hear me?

DR. LIM: Yes, we can hear you fine.

CHAIRPERSON FROINES: Randy?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: Yes.

CHAIRPERSON FROINES: Okay, great.

There was a question that Roger raised, and I'm concerned that Jim's not here. Where is Jim?

MR. MATHEWS: He'll be here shortly.

CHAIRPERSON FROINES: Roger raised a question about, has the Panel seen the final document with all the revisions that we discussed at a prior meeting? And I don't know the status of that. I sent an E-mail, and Jim's -- Roger sent an E-mail. So --

PANEL MEMBER BLANC: Well, I think there's some confusion, because the -- Paul Blanc here. I think there was some confusion, because the cover note for the second version that went out wasn't explicit; that what I'm sending now is a revised version to what was sent earlier in the week.

So it was implied, but it wasn't explicit. And I think the presumption should be made that -- and it did go out late in the day yesterday.

CHAIRPERSON FROINES: Paul, you're not on topic. You're talking about findings. I'm talking about the document.

PANEL MEMBER BLANC: Oh, so -- you mean this thing that came by --

DR. LIM: This is Lori. I talked to Jim Behrmann this morning. He said he was already in San Francisco. And we have sent out pdf files of the current draft of that. I don't know if -- has forwarded it to the rest of the panel.

CHAIRPERSON FROINES: When was that done?

DR. LIM: A week -- was that done earlier last week or this week?

PANEL LIAISON BEHRMANN: Just to clarify. This is Jim Behrmann, liaison to the panel.

John, you're asking about the report or the findings? I apologize.

CHAIRPERSON FROINES: Roger Atkinson sent an E-mail to everyone saying he did not believe that he had seen the final report.

PANEL LIAISON BEHRMANN: That's correct.

PANEL MEMBER ATKINSON: And you sent it out.

PANEL LIAISON BEHRMANN: That's correct.

Well, what -- DPR was -- and Tobi can clarify. But DPR was holding the final version -- the final draft of the report until the Panel's findings were adopted, because the Panel's findings become part of the final report. It was DPR's intention that the panel would adopt its finding, they would be added into the report, it would go back to the leads and to you, Chairman Froines, for your final review to make sure that all the panel's changes from the last meeting had been incorporated.

So what we have right now, and I've provided this morning to Roger and to Craig, copies of portions of that final draft that DPR's been holding on to.

CHAIRPERSON FROINES: Well, I have to say that

I'm very disturbed about this; because as far as I'm concerned, the Panel cannot adequately write the findings without seeing the final document. It can't be the other way around. We can't have the Panel seeing the final document after they've written their findings, because we've had meetings where there was a discussion about changes that were going to go into the document and the panel should have seen that because it would affect their view of the findings.

So that what we've got is the cart before the horse proverbially. And so we've got a panel now discussing findings without having seen the final document. That's the wrong way to do it.

So what's done is done. But what means is that Craig and Roger and I are going to have to go over the final report before -- we may vote on the findings today. But that is dependent upon what we consider to be the adequacy of the final report. And if it's not -- if we don't think the changes have been made appropriately, then we're coming back.

PANEL LIAISON BEHRMANN: And that's certainly the Panel's prerogative.

CHAIRPERSON FROINES: But that's a step we would like to have ignored.

PANEL MEMBER BLANC: Avoided.

CHAIRPERSON FROINES: Avoided.

DR. LIM: This the Lori.

CHAIRPERSON FROINES: It's always good to have Paul on my left side.

PANEL LIAISON BEHRMANN: If I can just -- just as an addition clarification. In speaking with DPR -- and, Tobi, feel free to step in. -- I know that they have revised the report based upon the comments received from the Panel at the last meeting and their review of the transcript. And the findings that is before the Panel were developed, you know, based upon the Panel's discussion and the OEHHA findings and input from DPR Staff.

CHAIRPERSON FROINES: But, for example, there was an extensive back and forth that I was involved in and Craig was involved in and Lori was involved in on the issue of carcinogenesis. And it was an important topic. And when the findings were written, there is not a word about carcinogenesis in the findings. So what was an obvious concern of the Panel did not get reflected in the findings. So, therefore, there is a clear omission on that issue.

PANEL LIAISON BEHRMANN: Well, just as a point of clarification, there was a question -- or a point raised in the draft findings for the Panel to discuss because it

was not clear to the staff in terms of what the Panel wished to find regarding carcinogenesis.

CHAIRPERSON FROINES: But that's what the leads and you and Lori are supposed to work out prior to this meeting. We come to this meeting today to finish this document. And we're clearly not going to finish it in its entirety. We may approve the findings -- the findings we currently have. But I suspect that we may have to go back and reconsider what's in the findings.

PANEL LIAISON BEHRMANN: Again, that's --

CHAIRPERSON FROINES: And I'm going to come back to Craig in a second on this.

PANEL LIAISON BEHRMANN: But, again, that's the Panel's prerogative. What the staff has put forth historically has ranged from one page to a dozen pages. Historically the Panel has drafted findings in a meeting. And --

CHAIRPERSON FROINES: What I'm saying is that -- it doesn't matter whether it's been one or a hundred pages. What I'm saying is that the problem we currently have is that the findings do not reflect one element that was a significant discussion at the meeting, and there was considerable discussion after the meeting between Lori and Craig. And so all that should have been dealt with before we walked into the room today is what I'm saying.

DR. LIM: Yes, this is Lori. Let me clarify that the question came from Dr. Landolph. And I worked out the wording with him as well as Craig on what needs to go in. And we came to the conclusion that we shouldn't include Dr. Breslin's thesis at this time because it's not -- it would not be balanced to present that work and not other work. And since the NAS is coming out with a final report, I would revise the wording on the oncogenicity. And so I have submitted through E-mail to everybody on the Panel who have asked questions with our responses and got approval for the responses. So that step took place.

CHAIRPERSON FROINES: Well, I have -- Lori, the problem is that nobody on this Panel has seen what's been worked out, because we haven't seen the final document. So we don't know -- you may say all this has been worked out with Landolph and Byus, but nobody else on the Panel knows what that is. And so the findings do not reflect that discussion. It's not -- there's nothing in the discussion on that topic. And I can guarantee you there's going to be. And so we're going to have to come up with language that reflects that issue, I think.

PANEL MEMBER GLANTZ: Do you have a copy of the final draft here?

PANEL LIAISON BEHRMANN: Yes, I do.

PANEL MEMBER GLANTZ: Is it done in a red line

strikeout so people can see the changes that were made?

PANEL LIAISON BEHRMANN: No, I don't believe it is.

DR. LIM: Mine is -- I have hard copy that we have a highlight. And I could point you to the exact page where that discussion is.

CHAIRPERSON FROINES: Well, okay. So we will come back to this issue. I had -- I want to raise two options with the Panel, one that I had suggested early on and a modified suggestion that Paul raised.

The problem is -- what I was concerned about is -- there is the document that Jim distributed this morning and presumably sent by E-mail last night.

PANEL LIAISON BEHRMANN: That's correct.

CHAIRPERSON FROINES: And I wasn't --

PANEL MEMBER HAMMOND: I don't have that.

PANEL MEMBER ATKINSON: That was the revised document. Yeah, the report.

PANEL LIAISON BEHRMANN: No, I did not send the actual report last night. I sent the revised findings last night.

CHAIRPERSON FROINES: Okay. And Kathy's proving my point. And I think that -- I talked to somebody else this morning, maybe Joe, who hadn't had a chance to read the revised document. So there are two people in the room

who have not gone -- have not had an opportunity to go over the revised document.

So we have two options: One, we can take the document that everybody has seen and we can go through it and Craig and Roger can point out where there are changes to the revised document or --

PANEL MEMBER HAMMOND: By document, you mean findings or the report?

CHAIRPERSON FROINES: Findings, findings.

Or we can stop the meeting right now and everybody take a half hour to read the new findings and then come back for the discussion.

PANEL MEMBER GLANTZ: But I thought the issue was having not seen the changes to the final report.

CHAIRPERSON FROINES: That's a separate issue, yeah.

PANEL MEMBER GLANTZ: I mean I think that the sequence, you know, normally would be that the report would be finalized and then the findings are dealt with. So I think the first thing that needs to be done somehow is to get some sense of whether you and the leads are happy with the final report or what changes, if any, need to be made there. And then -- and once that's done, then move on to the findings. And if there's a copy of the -- were there a lot of changes to the report?

PANEL MEMBER ATKINSON: Well, I have a number of changes in the -- in Volume 3, most of which seem to have been taken care of. Although there's still a couple of sentences which are -- I have real problems with.

PANEL MEMBER HAMMOND: I have a problem -- you know, this is just quickly looking at this --

CHAIRPERSON FROINES: We're not on the findings.

PANEL MEMBER HAMMOND: I know. But it's actually relevant --

CHAIRPERSON FROINES: Okay.

PANEL MEMBER HAMMOND: -- all right, I mean why I think there's a problem. It is a finding here, but it doesn't make sense to me in the context. And that relates to all of this. And it says that -- this is a finding -- that in parts of the report where an assumption is made, DRP should say there is no data. That's not a finding. But that's what should -- how the report should have been revised. Correct? So to me that already tells me -- I haven't seen this revised report. But it tells me the report was not revised according to our discussion. And you don't put in your findings that the report should say something different from what it says. That's not a finding.

CHAIRPERSON FROINES: Where are you at, Kathy?

PANEL MEMBER HAMMOND: Page 2, number 7. This

related to the assumption about the 5 ppm exposure. But you don't make a finding that they should -- I thought it was a discussion that should have been led to a change in the report, which apparently it didn't.

PANEL LIAISON BEHRMANN: Well, as a point of clarification. What the staff was suggesting there is the staff in its review of the transcript noted the Panel's discussion about that exact point. The staff felt it was a relevant point to raise to the Panel on whether or not the Panel wished to include something on this order. It was asked in the earlier draft as a question. In this version we -- based upon comments from Panel members, we actually changed it from a question into a finding because there was an expression of support from Panel members. This is for discussion. This is not --

CHAIRPERSON FROINES: Let me just clarify, because if you look at -- what I did this morning when I was going over this, I decided that the way to deal with this -- but Kathy's point's well taken -- what I did was to take out that according to the Panel's discussion rhetoric, which I think is a lot of silliness, and I just said, "This is not an appropriate assumption, period."

PANEL MEMBER HAMMOND: Well, I would first of all, if it's -- I mean I -- let me ask -- is the fact that it's here and the report did not -- it implies to me the

report did not change. I haven't seen the report. If the report did not change, was that because there was a disagreement with that discussion, you know, at that point?

PANEL MEMBER BLANC: How do we know it was the --

PANEL MEMBER BYUS: We don't know. No one's seen the report.

PANEL MEMBER HAMMOND: Well, that's what I'm saying. I've actually --

PANEL MEMBER BLANC: Wait, wait, wait. Are you saying -- Roger, you've seen the revised report.

PANEL MEMBER ATKINSON: I have looked at two sections of the revised report. I only got the revised report by E-mail attachment yesterday late afternoon.

PANEL MEMBER BLANC: And did you -- have you seen -- all right, John --

PANEL MEMBER HAMMOND: I don't think it's possible to have this discussion.

CHAIRPERSON FROINES: It's moot.

PANEL MEMBER BLANC: It's actually, John -- let me just say from point of view. I will not vote to approve findings for which the leads have not seen the final revised version of the report. I could live with me not having seen the final revised version of the report, if there was appropriate checks and balances that the

leads have seen it. But if the leads have not seen it, it's really not possible, as much as one would like -- I do think that we could -- I think that it's relevant for us to discuss draft findings so that we can highlight areas, such as Kathy has just done, of concern. But it will not -- I certainly will not support approving any findings today.

CHAIRPERSON FROINES: So my -- Stan. Sorry.

PANEL MEMBER GLANTZ: What I'd like to suggest, just based on a comment I think that Roger made -- I mean it sounds like it's close. So why don't we do this: Why don't we move on to another item and then while everyone else is eating lunch, maybe the leads could --

PANEL MEMBER BLANC: No, I'm sorry.

PANEL MEMBER GLANTZ: No?

-- would go over the report and see if the -- because what I recall from the last meeting was that -- which this Panel has done many times -- the report was tentatively approved subject to the changes that were outlined being made. And we said that's up to the Chair working with the leads to determine.

And so maybe -- I think to try to do this as a committee of the whole is not going to work. But if at a break or something they could -- if there was -- if this is feasible -- you guys would have to say -- maybe they

could look over the revised report while at lunch or at a break. And then if they're happy, we will have effectively done what should have been done before the meeting. And then we can come back to the findings. I mean I would -- because I hate to see this drag on. I mean I totally agree with what Paul said, but I also hate to have this put over to yet another meeting.

I mean what do the leads think?

CHAIRPERSON FROINES: Joe.

Let Joe --

PANEL MEMBER LANDOLPH: Well, I've read this. And, you know, what the guys have -- Roger and Craig have written is very good, so I understand what it says now. My recommendation would be we work a little bit on the findings, still considering them a draft findings, since we're all assembled here, and make it as good as it can be. And then we recess and let everybody that wants to read this report again, but not rush to do this. Let's get people a copy that want to have it and go through it and defer finalization till the next meeting.

CHAIRPERSON FROINES: Well, before you guys comment, let me just say one thing, because I think Kathy's point is particularly germane to this. There is the issue of carcinogenicity and then NAS, and that issue was discussed at length. Then Craig had interaction with

Lori. And my assumption -- my impression from that E-mail exchange was that Craig was at some point satisfied. And let me just finish and you can comment.

However, then we get a document that's supposedly our findings which doesn't contain a word about that carcinogenicity issue, which is in my view inappropriate. I think it's one thing to have a sentence in there that says the issue of carcinogenicity was raised in terms of osteosarcomas and that the Panel recognized that there is an NAS report and changes to this document will occur based on that report depending upon its findings. Some kind of holding. In other words we're not going to make a conclusion about carcinogenicity, but it should be addressed.

But leaving that aside, the issue that Kathy raised is if there is a real problem with the report dealing with that topic, then the report's going to have to change and our findings are going to need to see that change to reflect it. So it may be that Stan's right that we can do this the way you're saying. But it may be that, given what Kathy's raising, we may not be able to.

PANEL LIAISON BEHRMANN: Dr. Froines, if I can just as a clarification --

CHAIRPERSON FROINES: No, no. let's hear from Kathy.

PANEL MEMBER HAMMOND: I mean just speaking for myself, I don't think Finding 7 belongs as a finding. I just -- I had expected there would be a change in the document reflecting that concern. And that's what I would be happiest with. And if that's not what happened, me, for one, I'd have to go back and re-find where all those problems are, you know. And that becomes a big deal. So if that hasn't been done, to me that's a big problem.

CHAIRPERSON FROINES: What do think of what Stan's saying, Kathy?

PANEL MEMBER HAMMOND: I don't think there's enough time to do that. That's the problem. Well, first, I'd like -- I guess I would actually like to know two things: One was, were there changes made in the document that reflected that concern? Which is what I had expected would happen. And if not, why not? That would really help me understand.

DR. LIM: Maybe since I have a yellow highlight copy of everything that --

CHAIRPERSON FROINES: Wait a second, Lori.

And so at this point you're saying that it may be possible to do what Stan's suggesting but it may not be?

PANEL MEMBER HAMMOND: Right.

CHAIRPERSON FROINES: Okay.

PANEL MEMBER HAMMOND: I mean that's only from my

point of view. I really understand that I'm the prime person here, that these other people --

CHAIRPERSON FROINES: State it -- I'm sorry, Stan.

PANEL MEMBER GLANTZ: No, I was going to say what I'm suggesting might not be possible either. But I think -- I'd like to hear what the leads think about whether that's something that can be done reasonably without being too rushed.

CHAIRPERSON FROINES: With the one proviso that it appears that the leads have in one case not seen the final report, in one case have seen partial final report.

PANEL MEMBER ATKINSON: Yeah, the parts I've seen -- parts I looked at specifically, I have some problems with them. But they can be dealt with very quickly. It's just a couple of sentences, one on the executive summary and one or two on Volume 3 that are factually incorrect as far as I know. Just need a little change.

PANEL MEMBER BYUS: Well --

CHAIRPERSON FROINES: No, no, no.

PANEL MEMBER BYUS: Yeah, Lori -- This is Craig Byus.

Lori, did you put the NAS in the document?

DR. LIM: The NAS document is not ready. But I

did not reference it. But I footnoted the fact that they are looking at it.

PANEL MEMBER BYUS: Okay. So you added something to the final version about the NAS?

CHAIRPERSON FROINES: Well, I have a question. Is there a section in the report on the carcinogenicity of fluoride? Yes or no.

DR. LIM: Yes.

PANEL MEMBER BYUS: There is.

CHAIRPERSON FROINES: And so we need to know what that is.

PANEL MEMBER GLANTZ: Well, again, I would suggest you have a copy here. Maybe if we could move on to something else and then over the phone Lori could work with somebody, so we could get a couple of highlighted copies here; that then could the leads and Chair could look at at some point and decide is this close? Can we deal with it at this meeting or should we put it over?

CHAIRPERSON FROINES: Paul.

PANEL MEMBER BLANC: I think my feeling would be that even were it somehow to be technically possible to ad hoc quickly review the text, I think given the precedent and the historical context of the relationships between this Panel and the Department of Pesticide Regulation, I think we need to send a very clear signal in terms of what

is appropriate -- what is an appropriate pathway and before review and approval and what is not. It's -- given that we have a fairly clear pattern of operations with OEHHA and the non-pesticides, I don't -- I think it would send the wrong message. And I would rather be meticulous in how we approach this.

So even were it somehow to be technically possible to circumvent a more paced review, I don't think we should do it.

CHAIRPERSON FROINES: Kathy.

PANEL MEMBER HAMMOND: I concur.

CHAIRPERSON FROINES: Craig, how do you feel about that?

PANEL MEMBER BYUS: I would agree with them. I think we should spend some time on the findings so that we can get a sense of where everybody's concerns are, since we have them here, as you suggested. And then let's just -- I don't anticipate there being a problem with the document, with the final version. I believe that all of the concerns were addressed. Although if there are more that need further clarification, we can fix that as well.

I think the carcinogenicity issue is of importance. It is dealt with in the document. It is a -- the overall evidence is relatively equivocal, except for this one study that indicates possible some effects on

osteosarcomas, as I recall. I didn't bring all my notes to that effect. But it was -- it did involve a Ph.D. thesis that was unpublished. But there is some other evidence, and that is being reviewed by the National Academy. And so that should be indicated appropriately in the final version of the document. The potential concerns of that -- however that study turns out could be much more definitive than what we're looking at here.

But I don't anticipate there being a lot of problems. But I would like to take a look at the final version of it and allay anyone's concerns that there's a problem.

CHAIRPERSON FROINES: Let me ask a question. It goes to my knowledge base on this.

The question in my recommendations to Jim and to Roger and Craig -- I said that the issue of sulfuryl fluoride being transformed to fluoride was an issue that needed to be addressed in a finding. And I think we'd all agree with that.

And so Jim or Craig or whoever added a finding that says that fluoride is a metabolic product of sulfuryl fluoride. What worried me about that -- I'm happy with that sentence. But what worried me about that was when you have sulfuryl fluoride in a tented house, for example, or in the atmosphere, is sulfuryl fluoride being

transformed to fluoride irrespective of its metabolism? In other words is there atmospheric chemistry that goes on that forms fluoride and is there any -- anybody has ever looked at fluoride?

PANEL MEMBER ATKINSON: Doesn't seem to be any atmospheric chemistry, period, which is a problem.

CHAIRPERSON FROINES: You mean there are no studies on atmospheric chemistry?

PANEL MEMBER ATKINSON: Hmm?

CHAIRPERSON FROINES: You're saying there's no studies on atmospheric chemistry?

PANEL MEMBER ATKINSON: Well, there's no studies, no. And the expectation is that it's going to be pretty stable. There's some data on the solubility and hydrolysis in aqueous solutions, and that's what the new version of -- the latest version of the report has in it, which differs significantly from previous versions.

CHAIRPERSON FROINES: But if you have the possibility of hydrolysis -- you clearly have hydrolysis in an atmosphere that has a lot of water in it. So that --

PANEL MEMBER ATKINSON: But -- I mean what they come up -- what DPR comes up with is a lifetime of -- I think years, if not longer, in the atmosphere.

CHAIRPERSON FROINES: So you're saying that

that -- but here's my question: Have there been studies in which people have actually looked for fluoride?

PANEL MEMBER ATKINSON: You see -- let's see, in fact, yes, if you hydrolyze it, you get fluoride.

CHAIRPERSON FROINES: But in the air?

PANEL MEMBER ATKINSON: No, in aqueous solution. Nobody's looked in the air, no.

CHAIRPERSON FROINES: Nobody's looked the air?

PANEL MEMBER ATKINSON: No.

CHAIRPERSON FROINES: Which is an interesting issue. Kathy and I spend a lot of time working on pot-room asthma from fluoride. And so obviously the question came to me is that is there some fluoride that people are going to be breathing? And obviously that would have the potential for producing perspiratory effects.

MEMBER ATKINSON: I mean you're more likely to get fluoride in the atmosphere from the HFCs and HCFCs, just based upon the amounts released. They will lead to fluoride. That's known.

CHAIRPERSON FROINES: From the --

PANEL MEMBER ATKINSON: From the hydrofluorocarbons --

CHAIRPERSON FROINES: Sure.

PANEL MEMBER ATKINSON: -- and HCFCs.

CHAIRPERSON FROINES: Okay. So I think that is --

PANEL MEMBER ATKINSON: At least in rain water. I mean it's not going to be in the gas phase. It's going to be inaqueous droplets.

CHAIRPERSON FROINES: So my point is that you're -- the point is that everyone -- you and Craig and I then are comfortable saying that the primary route of fluoride exposure is going to be via metabolism?

PANEL MEMBER ATKINSON: Yeah, I would imagine that's right.

CHAIRPERSON FROINES: And that's consistent with the report?

PANEL MEMBER ATKINSON: (Nods head.)

CHAIRPERSON FROINES: So the -- I got off on a little side track there. But the last point of -- focal point was Paul's statement that he does not want to ultimately vote on findings without the Panel having an opportunity to review the document itself.

PANEL MEMBER GLANTZ: Can I just --

CHAIRPERSON FROINES: Yeah.

PANEL MEMBER GLANTZ: And I -- first of all, I agree totally with Paul, that in the future we -- DPR needs to do this the way we're used to doing it. And, that is, that the report is agreed to before the findings

are agreed to. So I think -- I'm willing to chalk that up to confusion.

(Laughter.)

PANEL MEMBER GLANTZ: Okay. And I think that message has been sent.

Again, in the -- I still think, since it sounds like the lead -- and the way we left it was the leads and the Chair would have the authority to act on behalf of the Panel. I still think it would be desirable to see if that's possible. If a copy of the report can be generated, that they can look at the highlights where the changes were and were not made, so that they can look at it and then come back with any outstanding issues. They may come back and say it's too much to do having looked at it for a half hour or an hour during lunch. But they may say this is okay. I haven't heard any huge points of controversy raised. And it just seems a same to let this drag on till whenever we meet again.

CHAIRPERSON FROINES: Well, I think that --

PANEL MEMBER GLANTZ: If we -- I mean if we can't do that, then fine. We'll let it drag --

CHAIRPERSON FROINES: Do we have copies of the report here?

PANEL LIAISON BEHRMANN: We have a copy right here.

PANEL MEMBER GLANTZ: They are photocopiers somewhere.

CHAIRPERSON FROINES: I don't know about that. This is a --

PANEL MEMBER HAMMOND: You have a conference center?

PANEL LIAISON BEHRMANN: There is limited copying capability here at the conference center.

PANEL MEMBER ATKINSON: I don't personally -- I mean I don't personally need a copy. The way I think this was left again was with the leads and the Chair. And what I would suggest is that you find a place there's a copier, copy it, get on the phone with Lori, mark the changes and then give it to them and see what they think.

CHAIRPERSON FROINES: Stan, I think that the population is larger than you're thinking. I think there's a lead -- there are the two leads. But one of the people who had extensive interaction on this was Joe. And Kathy's obviously raising questions. And so you've got four people, plus me is five, who --

Okay. Then it's too much probably.

CHAIRPERSON FROINES: And so we haven't -- we've got one document. And you can envision five people standing around just one document?

PANEL MEMBER GLANTZ: No, no. I think they

should make copies of it.

CHAIRPERSON FROINES: There's no copying capability.

PANEL MEMBER GLANTZ: There's got to be a cop -- I mean we have several other agenda items. I think that you could get on -- that they could get on the phone with Lori, mark it up so the changes are obvious, that people don't have to read every word. And then while we're discussing these other items --

CHAIRPERSON FROINES: How many pages are we talking about?

PANEL MEMBER GLANTZ: I don't know. It looks like it's a half inch thick. But there's got to be a high speed copy machine somewhere not too far from here.

PANEL LIAISON BEHRMANN: The health assessment is 115 pages.

But just as a clarification again, the Panel expressed its sentiment at the last meeting, but the report was in very good shape. And the changes were not, I don't believe, that extensive. Again, I would defer to DPR staff to identify what those sections are.

DR. LIM: Yeah, actually for the staff all you need to do is Xerox up to 103, which is the end of the conclusion. The rest of our references and the tox summary, which there were no changes. There's also an

appendix on fluoride on Appendix B that I made a few changes to, but that the relevant section to that one.

In Volume 4, which is DPR responses to comments, only need to make a copy of that, because that's essentially documents of responses, and then no addition to that since the last time.

In Volume 2, I could also identify these pages up to the end of the conclusion, which is 60. So these could be considerably shortened, you know, copying everything, but not completely.

CHAIRPERSON FROINES: Stan?

PANEL MEMBER GLANTZ: Um-hmm.

CHAIRPERSON FROINES: I personally, and not speaking as a Chair but just as a Panel member, am uncom -- hearing that, I'm uncomfortable with our trying to go through this document today.

PANEL MEMBER GLANTZ: Okay. Well, that's fine. I'm --

CHAIRPERSON FROINES: How do other people feel? I mean where are we at?

PANEL MEMBER BYUS: I would like to see this document dealt with. But I'm -- I think if we try and rush through it today, it's going to be counterproductive, because I really believe that there are minor changes. But it's just the way we're going to go about it is not

going to be productive. And so I would propose that we postpone the consideration -- the final consideration of the document. We'd discuss the final --

CHAIRPERSON FROINES: That means we don't vote on the findings?

PANEL MEMBER BYUS: Correct. But we do discuss the findings today since we're here. And that way we can take -- Roger and I can -- we can incorporate salient changes to the findings and tighten up the language. We can then return after viewing the revised document completely and make sure that it addresses everybody's concern and the right language. And I don't we'll have any problems at all. It will take, well, theoretically, five minutes at the next meeting.

But I have feeling if we can try and do this today, it's not going to work.

CHAIRPERSON FROINES: Okay. Then I rescind my suggestion.

Okay. My next question then is: Do you want to spend time at this meeting going over the findings?

PANEL MEMBER BYUS: Yes. I would like to go over the findings, because I'd like to make sure, you know, and -- the findings were written a little hastily, but that's been done before here. We can tighten up the language and make sure that we're addressing everything

appropriately.

CHAIRPERSON FROINES: I should say that this is the last time this is ever going to happen as far as I'm concerned. This is not as a procedural matter -- getting findings on the Friday before we meet is not the way we're going to do business.

PANEL MEMBER HAMMOND: And before we see the final report.

CHAIRPERSON FROINES: Yes.

PANEL MEMBER FRIEDMAN: May I just add that when this revised final report comes out that we all see it, not just the leads?

CHAIRPERSON FROINES: Of course. Absolutely.

PANEL MEMBER FRIEDMAN: I mean with the track changes so that we can see them?

PANEL MEMBER BYUS: Right, with track changes. Everyone should get a copy of it.

DR. LIM: Excuse me. This is Lori. And for the track changes, it could be quite a mess to do that, because I shifted paragraph and -- what I would like to propose is that I just yellow highlight all the XO changes on this version. I think it would be more readable.

PANEL MEMBER FRIEDMAN: Sure, sure. Fine.

PANEL MEMBER BLANC: Fine.

CHAIRPERSON FROINES: Okay. Let's start with the

latest findings and go down and -- Craig and Roger, you're going to be on target on lead to say where changes have occurred. So --

PANEL MEMBER BLANC: Just to call to people's attention, the version of -- the most recent version of the one that says "for discussion" at the very top.

CHAIRPERSON FROINES: Right.

And Jim needs to be at the tables, because he's had a hand in all of this.

PANEL MEMBER BYUS: All right. Well, I'll do the best I can here.

On page 1 of the original finding version, John and I both had some concerns over the term "ambient exposure" -- which would be like the second paragraph. "This report was written to meet the statutory requirements for state's toxic air, which addresses ambient air exposures and also," et cetera. "The review was focused primarily on the general population exposures to ambient air concentrations of sulfuryl fluoride." We had some concern the fact that the report didn't focus simply on ambient air concentrations. It dealt with peak exposures, all by an occupational exposure in a sense of the workers, et cetera. So that really was inaccurate. We took that -- that sentence was removed out of the document -- out of the findings.

CHAIRPERSON FROINES: We're on paragraph 2?

PANEL MEMBER BYUS: Right, on paragraph 2.

There was also -- I mean I also had some concern that in reality there isn't -- I mean there isn't any ambient exposure much to sulfuryl fluoride; is that correct, Roger? I mean there is no such thing as ambient. I mean it depends on how you -- I mean it's minimal.

PANEL MEMBER ATKINSON: Yeah. I mean there's obviously an exposure when they're releasing it from the tented house. But otherwise --

PANEL MEMBER BYUS: But really that's not ambient. That to me is part of the overall application. Ambient --

PANEL MEMBER ATKINSON: It's an application, you're correct.

PANEL MEMBER BYUS: Yeah, it's an application.

So ambient to me -- and again that's why I don't like that term in this case, because there really isn't much ambient sulfuryl fluoride.

CHAIRPERSON FROINES: Well, I think there's a question of what the legislation says.

PANEL MEMBER BYUS: Right. But it is --

PANEL MEMBER ATKINSON: -- which increases exposure.

CHAIRPERSON FROINES: What does 1807 say?

PANEL MEMBER BYUS: No idea.

PANEL MEMBER BLANC: Well, but I mean it sounds like it's a completely appropriate deletion. Because what you're saying is that the Panel in fact didn't only focus on that, so why say that. So that's good -- a good deletion.

CHAIRPERSON FROINES: That's fine.

PANEL MEMBER BYUS: Okay, I suggested --

CHAIRPERSON FROINES: But let me just -- I'm sorry for being a bore on this. This says, "Also DPR's SB 950 requirements addressing" -- I don't think we need to have parentheses in there, but that's easy enough to take out -- but "addressing both occupational and general population exposures." The reason I asked the question about the legislation is that that paragraph isn't about -- it seems to me it's not about what's in the document. It's about what's in the law. This paragraph refers to the law, not the document. And so that's what I want clarification on. Is this paragraph in there saying that 1807 says that we address ambient air exposures? Because that's an important issue. Because I don't know if it says it. But if it says it, we're bound by it.

But as far as I'm concerned, if you have a -- if we had a vinyl chloride factory and it was emitting vinyl chloride and we were worried about the people who lived

closest to the vinyl chloride factory, that's not ambient vinyl chloride; that's a hot spot. That's an exposure close in. And so to the degree that we are restrained by the legislation -- so it's a legislative issue, not a --

PANEL MEMBER ATKINSON: That's how you view the word "ambient".

CHAIRPERSON FROINES: But I don't know -- if the Legislature says that what we're doing is looking at toxic air contaminants in the ambient context, then that's what we're -- that's what the legislation says.

PANEL LIAISON BEHRMANN: This is Jim Behrmann.

The legislation does -- in the legislative findings refers to the admission of substances into the ambient air. But just as a point of clarification, ambient air can be at the fence line of a facility. We would consider that to be near-source ambient.

CHAIRPERSON FROINES: Well, would you -- read that again, because, you see --

PANEL LIAISON BEHRMANN: The Legislature finds and declares -- this is in the "intent" language -- that public health, safety and welfare may be endangered by the admission into the ambient air of substances which are determined to be carcinogenic" --

CHAIRPERSON FROINES: Yeah. And I think what that says is different than what this says. This says the

contaminant statute which addresses ambient air exposures. That which you read doesn't -- does not mean this.

PANEL MEMBER HAMMOND: It addresses releases into the ambient air.

CHAIRPERSON FROINES: Right.

PANEL MEMBER BYUS: Okay. So you're saying which addresses release --

CHAIRPERSON FROINES: Which addresses releases --

PANEL MEMBER BYUS: -- into --

CHAIRPERSON FROINES: -- into the ambient air.

PANEL MEMBER BYUS: -- the ambient air. Okay. That's very good.

Well, it is an important point because, you know, when we talk about ambient exposures and this is --

CHAIRPERSON FROINES: Well, this is a major issue with pesticides because of the drift question.

PANEL MEMBER BYUS: Correct, major issue.

All right. I added -- statement 1, page 1. Where did I add it?

Oh, I think we put it now down to on paragraph sub-item 2 --

PANEL MEMBER BLANC: Before you get there, just a note, Craig.

PANEL MEMBER BYUS: Sure.

PANEL MEMBER BLANC: You'll just need, and

subsequent to this meeting, probably to add to the chronology that there was a further discussion at our December 13th meeting, presuming that -- just make a note to yourself then.

CHAIRPERSON FROINES: So that's paragraph 1?

PANEL MEMBER BLANC: Paragraph 3.

CHAIRPERSON FROINES: Three, right.

PANEL MEMBER BYUS: Three, okay.

PANEL MEMBER BLANC: The 4.1.

PANEL MEMBER BYUS: Okay. So I added on two, a statement to the effect that sulfuryl fluoride is a colorless, odorless gas, highly toxic to human beings and mammals. I mean I think --

PANEL MEMBER BLANC: You mean other mammals?

PANEL MEMBER BYUS: And all mammals. I'd actually had it put in up above, and I think it fits a little bit better down here.

I just want to make sure that they understand that it's -- you know, nothing against DPR. But it's a rodenticide and an insecticide, but it kills people at the same concentrations as it's killing rodents. So it's a highly, highly toxic compound --

CHAIRPERSON FROINES: I agree with that.

-- with minimal selectivity towards its toxic targets of insects and rodents. There's no select --

isn't this right, Joe?

PANEL MEMBER LANDOLPH: (Nods head.)

PANEL MEMBER BYUS: There is minimal to no selectivity here in terms of its toxicity. So --

CHAIRPERSON FROINES: Craig, I would -- I have no problem with that. I think you're right. But I think that should be put back to the section where we have -- where we're dealing with health effects, because I think that the second sentence should not be a finding. It says, "Much of the margin of safety using this compound in relation to minimizing human exposure relies upon the good application practices of licensed pesticide contractors." I don't think that's an appropriate SRP finding.

PANEL MEMBER BYUS: That was my -- I put that in. That was me. I --

CHAIRPERSON FROINES: That sort of --

PANEL MEMBER BYUS: The reason is --

CHAIRPERSON FROINES: -- I mean we go through all this about five parts per million and we're saying, "Well, the way we deal with it is with appropriate practices by contractors."

PANEL MEMBER BYUS: Well, but that is facts --

CHAIRPERSON FROINES: No, but this is a regulatory document. This is not a voluntary compliance document that says we're going to rely on contractors to

do the right thing.

PANEL MEMBER BYUS: Well, we are. I mean what I'm trying to say --

CHAIRPERSON FROINES: Who knows.

PANEL MEMBER BYUS: -- but looking at it as a select --

CHAIRPERSON FROINES: Once it becomes a TAC --

PANEL MEMBER BLANC: Well, let him --

PANEL MEMBER BYUS: Let me answer, John.

I mean the point is, this is a highly toxic compound, colorless, odorless gas that you find virtually nowhere else in the environment except in these tented buildings where we rely -- its toxicology as it relates to the rest of the environment and exposure really relies on the application by these contractors. I mean -- so in my view, it does -- it's something you want to highlight about the toxicology -- environmental toxicology above this thing.

PANEL MEMBER BLANC: You're both -- you're both saying -- wait, wait. Can I just interrupt. I think you're both saying the same thing. This was a critique here. This was not a free pass for contractors.

PANEL MEMBER BYUS: No, no, no, it's a critique.

CHAIRPERSON FROINES: I said that I'm happy with the first sentence, although I think I should be

elsewhere.

I'm not happy with the second sentence because that is a risk management issue of how you control Vikane. It may be that somebody's going to come up with other approaches to its control and it's not going to rely on licensed pesticide contractors' good work practices. That's -- this is a risk management statement.

PANEL MEMBER FRIEDMAN: Well, it's a factual statement that's a guidance to risk management. But I don't see that it doesn't belong here.

CHAIRPERSON FROINES: Why should it be a finding of this Panel? It deals with risk assessment.

PANEL MEMBER HAMMOND: It strikes me -- I mean, you know, maybe I need to get clear on again the role of the Panel. But it does strike me that it's an important observation that's not necessarily true of other materials, that you have people who are out in the general population who are releasing this. These are the contractors. And we all know that that's a more difficult problem to protect the public from than something that's like one factory or something like that. So that highlighting the fact that the practice -- the work practices of these individual contractors will be the major determinants of what those ambient emissions are I think is an important point.

CHAIRPERSON FROINES: I'm sorry. I don't think this document deals with how we're going to control this compound.

PANEL MEMBER HAMMOND: No, no, this is something --

We don't know --

PANEL MEMBER BYUS: It's not a control. It's --

PANEL MEMBER HAMMOND: It's an observation.

CHAIRPERSON FROINES: No, but it is -- I know it's an observation. What I'm saying is that there may be other approaches to this -- to how one prevents exposure. That's not part of the document we reviewed. This is a one glib -- one sentence thing that says contractors can deal with it.

PANEL MEMBER BYUS: No, no, no, no, no. in fact --

CHAIRPERSON FROINES: There may be other approaches. And unless you have a document that addresses the approaches to control --

PANEL MEMBER BYUS: No, the entire document on exposure assessment is replete with how Vikane is applied and how it's vented and the different methods and how the dosage is calculated for houses. It all depends upon the contractor's ability to apply and handle this.

PANEL MEMBER HAMMOND: May I make a suggestion.

I'd like to make a suggestion here. And, that is, rather than saying -- I think it's the margin of safety that bothers John. And we could take that term out. I think what one might say is that the emissions of this material into the environment are predominantly determined by the practices of contractors.

PANEL MEMBER BYUS: There you go.

PANEL MEMBER GLANTZ: What I think --

PANEL MEMBER HAMMOND: Then is doesn't say how to control that.

PANEL MEMBER GLANTZ: Yeah. I think it may be that the -- I mean I hadn't -- this hadn't bothered me till I heard this discussion. But it may be that the way to deal with this issue is to move that sentence. Because the first sentence, sulfuryl fluoride is a colorless, odorless gas, highly toxic to human beings and mammals, is a biological statement.

And if you look down later in the findings, around number 6 or 7 or 8 or 9 or 10 or 11, all of those are talking about what happens when you apply it. And so -- and, in fact, the estimated concentrations -- I mean again I have -- like everybody else, I haven't looked at the report in a long time. But as I recall, the estimated public exposures were presuming that the material was being applied according to the way it was supposed to be

applied. So that's actually an important assumption which is built in to the whole risk assessment part of the report.

So I agree with Craig, that something like this sentence should appear because it's a condition -- a lot of the other findings are conditioned on it. It's really the nature of an assumption that DPR made.

But I think the right place to put that is not here where it -- in connection with the biology, it's somewhere in these later findings beginning with -- somewhere between 6 and 11 where there are discussions about, you know, the levels that you expect to see when it's actually used. So I think that's the -- that's how I would resolve this issue.

CHAIRPERSON FROINES: I don't understand what you just said.

PANEL MEMBER GLANTZ: What I'm saying is is that in the report as I recall it there are statements about the levels of this compound that people are exposed to or when they're around tented houses. And the calculations of those levels and the measurements of those levels that -- I don't remember which it was -- presumed that it's being applied properly. So that's a very important assumption that underlies the exposure levels that are discussed later in these findings.

So I think that needs to be stated, that the whole document in many ways is predicated on the assumption that -- in terms of the exposures, the assumption that the stuff is being applied properly. So I think that needs to be stated in here.

PANEL MEMBER BYUS: It's not only -- you know, there's many -- I mean as you read this document, if the house is not tented properly, if it leaks, then the bystander levels go way up. They're much higher than you would calculate or observe. When you untarp the building, or whatever the various procedures, how that is done markedly affects how the workers are exposed. I mean it's a very -- there's a lot of assumptions, as you are correct, throughout the exposure part that rely on these application procedures. That's all I'm trying to get -- that's all I'm trying to --

PANEL MEMBER GLANTZ: But then I think the way to deal with this without upsetting John is to simply remove this and rephrase it as saying the exposure estimates in here are based on several assumptions, and then list them. That's one of them. But I think highlighting those assumptions is a good idea.

PANEL MEMBER BYUS: Are you okay with that, John, if I do that instead of --

CHAIRPERSON FROINES: I won't accept this

sentence the way it's currently written --

PANEL MEMBER BYUS: We'll take the sentence --

CHAIRPERSON FROINES: Let me finish.

-- because this thing relies upon the good application practices of licensed pesticide contractors. We have no knowledge whatsoever about whether or not good application practices are used with respect to this chemical. We have no knowledge of this. So it says that we --

PANEL MEMBER BLANC: No, we'll reword it when we get to it. But, John, your point is well taken. And I think we're going around in circles.

PANEL MEMBER GLANTZ: Well, let's move on. I mean I think that we all agree it should be deleted from number 2 --

PANEL MEMBER BLANC: -- and reworded and put --

PANEL MEMBER GLANTZ: -- and reworded and put somewhere else as an assumption.

PANEL MEMBER BLANC: And, Craig, can you just put the phrase -- and we also -- I think John's point was well taken that this point about the -- it's here in general toxicity should be the opening gambit in the toxicity section.

PANEL MEMBER BYUS: Okay.

PANEL MEMBER BLANC: And that -- and I would just

suggest that you say it's highly toxic to human beings as well as to other mammals.

CHAIRPERSON FROINES: Okay, Craig. Go ahead.

PANEL MEMBER BYUS: Okay. This is all very useful, because we'll hopefully not have to do this again.

PANEL MEMBER BLANC: So Point 2 -- the former point 2, which is now Point 3, didn't really change, right?

PANEL MEMBER BYUS: Right.

PANEL MEMBER BLANC: Can I -- can I suggest that in the new Point 3, which now will actually become Point 2 again -- I presume that the reason it talks about 2003 is because that's the last year for which data were presented in the report; is that correct? I mean that's a reasonable assumption.

PANEL MEMBER BYUS: Yes.

PANEL MEMBER BLANC: And I would just put parenthetically after -- in 2003, blah, blah, 1, 2 -- we're using the Los Angeles County alone, parentheses "the last year for which data were presented in a report."

CHAIRPERSON FROINES: Is it correct to say that that's the last year we have data?

PANEL MEMBER BLANC: Well, that's the last year for which there were data in a report.

CHAIRPERSON FROINES: Well, I'm asking the

question differently.

DPR ASSISTANT DIRECTOR JONES: This is Tobi Jones.

When this report was written that was the last year for which we have data. We --

CHAIRPERSON FROINES: That's not my question.

My question was: Is this the last year we have data? And if it isn't, then we can change the report.

DR. LIM: This Is Lori Lim. I checked our website yesterday. 2003 is the latest data that's posted. But the document -- 2002 is the last year that was cited.

CHAIRPERSON FROINES: Then it should --

PANEL MEMBER BLANC: Well, how can the document -- Paul Blanc here. How could the document only refer to 2002 and the findings refer to 2003?

DR. LIM: 2003 is -- it's the most recent. But there is documents in the work for a long time. So we can change that. We could certainly update it.

PANEL LIAISON BEHRMANN: In the staff's presentation, they cited the most recent data available from their website.

PANEL MEMBER BLANC: Yeah, but this is a very important point, even though this is a very small matter. This -- the findings cannot refer to data which has been only presented to the Panel but which is not in the

report. These are findings about the report.

PANEL LIAISON BEHRMANN: That's a good point. And that's an error on my part then.

CHAIRPERSON FROINES: So what is it? Because we have data in here where we say that the use of fluoride increased to 2002, and then in 2003 -- 2003 they refer to Los Angeles. So the question is: What is it? What do we have?

PANEL LIAISON BEHRMANN: The report could be updated to include the 2003 numbers. That's one option.

Though the point the staff was making here or the suggested point was: In the staff presentation by DPR, it was notable that of three million pounds, almost half was applied in a single county.

PANEL MEMBER BLANC: Well, I would suggest both things. I would suggest that the report be updated to have the 2003 data, and that our findings retain the 2003 data with the parenthetical comment that this is the last year -- that that is the most recent year for which data are available, or that is the last year for which data were cited in the report, or both. Whatever's the most conservative statement.

PANEL MEMBER LANDOLPH: Joe Landolph.

And can you have that, Jim -- can you have the 2003 data, the generic data as well as for Los Angeles

County, so it's all consistent?

PANEL LIAISON BEHRMANN: Yes.

PANEL MEMBER LANDOLPH: Thank you.

CHAIRPERSON FROINES: Okay. We're up to 4?

PANEL MEMBER BYUS: Four. I think -- I don't know whether it was new or old 4.

I added something to the effect that after -- okay, on 4, that after fumigation of the tented structure sulfuryl fluoride in the air of treated structures is released through clearance or aeration of a structure using a variety of procedures, including the TRAP and Stack defined methods. All of the applied sulfuryl fluoride is released into the atmosphere as a gas.

It just clarified the original statement, which -- which didn't clarify it. Is says that -- the original statement said after fumigation sulfuryl fluoride in the air of treated structures is being released in the atmosphere as a gas.

In reality, it's applied. It sort of leaches out slow -- relatively slowly even over the tented structure. And then it is vented by these two very specific methods, only one of which we use in California, correct?

CHAIRPERSON FROINES: Anybody have any problem with 4?

PANEL MEMBER BYUS: But I think it's important,

because this again -- this is a very unusual thing here compared to any other compound that I've ever dealt with.

PANEL MEMBER BLANC: So in fact there -- you say there are a variety of procedures. Two of the procedures are the TRAP and the Stack defined methods?

PANEL MEMBER BYUS: Uh-huh.

PANEL MEMBER BLANC: But then you indicated that those are the only two procedures, and only one of them is actually approved in California?

PANEL MEMBER ATKINSON: I would be attempted to say use in two main procedures.

PANEL MEMBER BYUS: Which one's used in California? Jim, which one's used in California?

PANEL LIAISON BEHRMANN: In California, the TRAP method is the one that's used.

PANEL MEMBER BLANC: Is that by regulatory or by convention?

PANEL LIAISON BEHRMANN: I do not know.

DPR ASSISTANT DIRECTOR JONES: Randy, do you know that answer?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: This is Randy.

Yes, this is a regulatory requirement.

PANEL MEMBER BLANC: Well, I think -- and that's stated in the document clearly?

PANEL MEMBER BYUS: Yes, yes. It's clearly stated in the document, isn't it, Randy?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: Yes.

PANEL MEMBER BLANC: Then I think I would probably clean up this point a little bit then by making clear that these are the two main methods, but in fact only the TRAP -- is that right, the TRAP method is currently regulatorily approved in California?

PANEL LIAISON BEHRMANN: Yes.

CHAIRPERSON FROINES: Then we don't really need that sentence, do we, that describes the Stack method?

PANEL MEMBER ATKINSON: No.

CHAIRPERSON FROINES: Let's try and tighten this stuff up.

PANEL MEMBER BYUS: Okay.

PANEL MEMBER ATKINSON: Point No. 5 as it presently is was rewritten quite a bit. But it still has a problem in that it doesn't reflect what's in the final -- the latest version of the final report -- of the report. So it needs changing.

I would suggest a slightly mangled version of the last paragraph on page 8 of Volume 3 replacing. But I can do that.

PANEL MEMBER BLANC: Roger, when you say

lifetimes here, do you mean persistence? Or is that --

PANEL MEMBER ATKINSON: Well, no, lifetime is defined as a 1 over E lifetime, the time to -- decreased by 1 over E. Persistence doesn't mean anything to me.

PANEL MEMBER BLANC: So you mean like half life?

PANEL MEMBER ATKINSON: No, it's different to a half life. I can change it -- I mean it can be easily changed to a half life.

PANEL MEMBER GLANTZ: Aren't you talking about a time constant then?

PANEL MEMBER ATKINSON: A what?

PANEL MEMBER HAMMOND: It's a time to achieve 1 over E times the original concentration.

PANEL MEMBER ATKINSON: That's right, that's 1 over 3. It could be a half life, which is the time to go down 1 1/2.

PANEL MEMBER BLANC: I see.

But, yeah, if you could just tighten that up so that nobody thinks you mean --

PANEL MEMBER ATKINSON: But it needs rewriting, because it no longer reflects what's in new version of the report.

CHAIRPERSON FROINES: Well, what -- I'm sorry, Paul. Go ahead.

PANEL MEMBER BLANC: And when you say the

compound in water, you know, a general reader would read that as in water. And do you mean -- that could mean in a saturated atmosphere? Or does that mean in water?

PANEL MEMBER ATKINSON: It means in water droplets. But that will all change, because the report is quite different now to what it was at the time this was --

CHAIRPERSON FROINES: Just for the sake of -- okay. That's okay, because we're going to approve the findings at the next meeting. So okay.

PANEL MEMBER BYUS: Correct.

PANEL MEMBER BLANC: And can you also clarify, is -- in the current listings of greenhouse -- is there a formal listing of greenhouse gases --

PANEL MEMBER ATKINSON: Not to my knowledge.

PANEL MEMBER BLANC: -- anywhere?

So the U.N. --

PANEL MEMBER ATKINSON: That's one of the things that they need to look into.

PANEL MEMBER BLANC: And so that's a modification you wish to see in the document, with either a statement saying this does or does not appear on the current list of greenhouse materials?

PANEL MEMBER ATKINSON: I don't even know if there is a current listing, is there?

CHAIRPERSON FROINES: This is a very interesting

topic. I was at EPA last week talking with them about chemicals that are important in global warming. And they want to have a national conference to define chemicals that are important in global warming. So it's actually an issue that is current and we're going to sponsor it. So it's --

PANEL MEMBER ATKINSON: There's a thing called a global warming potential, which you can calculate from computer models -- atmospheric computer models. And that needs to be done for sulfuryl fluoride.

CHAIRPERSON FROINES: Yeah.

PANEL MEMBER ATKINSON: Which takes into account its lifetime, its infrared absorptions, and its concentration.

PANEL MEMBER BLANC: But in the Kyoto accords or in the International Treaty on Fluorocarbons, that must list --

PANEL MEMBER ATKINSON: Those are two different things.

PANEL MEMBER BLANC: Right. But that -- look, for example, that lists specific fluorocarbons that come under --

PANEL MEMBER ATKINSON: That's the Montreal protocol and its revisions. The Kyoto protocol, as far as I -- I wouldn't want to be necessarily on record, but as

far as I would imagine, all sorts of chemicals come under it if they become a significant contributor to radiated forcing.

PANEL MEMBER BLANC: Well, you know, I would be satisfied with a statement in the document which says, you know, although this chemical currently does not -- there are these lists -- if there are such lists and it does not appear on them, it doesn't mean that it might not in the future. But a statement to that effect would probably clarifying in the document. And then we could actually refer to it or not refer to it in our findings.

PANEL MEMBER ATKINSON: I think the -- if it's tightened up on the statement. But the global warming potential needs to be evaluated, is the thing that will be the key to it.

CHAIRPERSON FROINES: That's good.

PANEL MEMBER BYUS: All right.

CHAIRPERSON FROINES: Can I just make a comment about 6?

PANEL MEMBER BYUS: Yeah, I was just going to say, someone -- we should talk about 6 a little bit. It's a little bit of soft.

CHAIRPERSON FROINES: I would like to -- what I did was to change it so that the sentence that this paragraph started as follows: "For residents and

neighbors (referred to in the report as 'bystanders'), exposures to sulfuryl fluoride are primarily acute and of short-term duration. Ambient air exposures to the general population other than neighbors were not estimated since they were assumed to be negligible."

In other words, I basically took out that first sentence, which I think is not an SRP finding. Whereas the statement about that they are primarily acute and short-term duration is a specific statement that represents a finding. What comes is the -- the assumption that on a given day the likelihood of community-wide exposures is very low, I don't think we need to get into that speculation. I think we should make definitive statements rather than speculative ones, even if it's true.

PANEL MEMBER BLANC: But I do think, by the way, that at the conclusion of this point is where a phrase should be inserted that in fact all of these presumptions are based -- or all of this is based on the presumption that a series of recommended application procedures are strictly followed using a chemical which has a very narrow margin of safety, or something to that effect. Because that's the point you were trying to make.

PANEL MEMBER BYUS: Right, that's the point I'm trying to make.

PANEL MEMBER BLANC: And that's where you were -- that's where it fits in.

CHAIRPERSON FROINES: So that's good. That's the thing we argued about before.

PANEL MEMBER BYUS: But that's the point I'm trying to make.

PANEL MEMBER BLANC: Yeah, I know, I know.

CHAIRPERSON FROINES: And so you can take -- what he just said I think will -- from the transcript will almost be the language you want to use.

PANEL MEMBER BYUS: Exactly.

CHAIRPERSON FROINES: Unless he wants to try and state it again.

PANEL MEMBER BYUS: Say it -- could you just quickly say a couple of those words that capture it.

PANEL MEMBER BLANC: These -- this is based on the presumption that all applications occur according to -- occur strictly according to regulated application procedures.

PANEL MEMBER BYUS: I got it, I got it, I got. Yeah, that's good. I just wanted the first part -- the first part of the sentence.

Very good.

CHAIRPERSON FROINES: Okay. So are we okay on 6 then?

PANEL MEMBER BYUS: Yes.

CHAIRPERSON FROINES: And 7 is Kathy's.

What I did, Kathy, is I basically -- you may -- I basically took out that section that starts "according," in other words the last three lines, and I added, "There is no quantitative data addressing this issue and remains an assumption." So -- but this is your call.

PANEL MEMBER HAMMOND: I had actually wanted the report to change so that the report itself said that this was an assumption that there was no data. In which case the "no finding" would be required by the Panel.

Now, I guess my question was: Was that change made? And implicitly I'm hearing it wasn't. And I'm trying to understand why that change wasn't made. Is there some resistance to that?

PANEL MEMBER BYUS: No, I don't think -- do you have any resistance?

PANEL MEMBER ATKINSON: No.

PANEL MEMBER BYUS: I don't think there's any resistance.

PANEL MEMBER HAMMOND: A mean this is just to make the report a better report.

PANEL MEMBER BYUS: Whether the report actually did change, I have no idea because I haven't seen it. But I didn't detect any problems. I mean I think we should --

I think -- I agree with you. I think it's best to make that statement clear in the report. And that way we don't have to -- we can take it out of the findings.

PANEL MEMBER HAMMOND: Right.

DR. LIM: This is Lori. Can I make comment?

In the conclusion, this is the -- I added two statements to the conclusion. One of which it says, "In this document exposure estimates were based on the assumption that labor instructions were followed such that the maximum exposure was 5 ppm." This is in the conclusion.

PANEL MEMBER BYUS: Okay. Well, we can -- we'll discuss that further to make sure that it really --

PANEL MEMBER HAMMOND: So I would suggest that -- that sounds very good. Thank you.

Maybe you might even want to say, if that's not true, then there could be higher exposures. Because the reality, as we know, that those precautions are not always taken. But it would also be good to have that similar statement in the body of the report itself where that -- to which that conclusion's referring.

CHAIRPERSON FROINES: Can she read that again?

DR. LIM: It says -- two sentences are the thing you guys are most interested. "Additional exposure data, in particular those with maximal application rate and for

commodity fumigation would provide better estimates of actual exposure. In this document exposure estimates were based on the assumption that label instructions were followed such that maximum exposure was 5 ppm."

PANEL MEMBER HAMMOND: And I'm suggesting that we add to that a statement that says that this assumption may not always be valid and that -- perhaps maybe suggest that some measurements should be taken to ensure the protection of these workers.

PANEL MEMBER BLANC: This is Paul Blanc.

Does the document somewhere -- and I apologize for not being more familiar with it so that I don't even have to ask this question -- discuss whether or not there have been ever citations by the appropriate regulatory authorities for violators --

PANEL MEMBER HAMMOND: Or inspections.

PANEL MEMBER BLANC: -- or inspections?

The inspections for structural pest applicators --

PANEL MEMBER HAMMOND: These are non-structural, right? These are the commodity?

PANEL MEMBER BLANC: I think we're talking about everything, aren't we?

DR. LIM: Yes. There's a structural and the commodity.

PANEL MEMBER BLANC: Okay. So the structural pest applicators fall under OSHA inspection or under DPR only?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: It's DPR's authority.

PANEL MEMBER BLANC: Okay. Has DPR ever inspected a structural pest applicator?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: Yes.

PANEL MEMBER BLANC: Have you ever cited one?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: Yes.

PANEL MEMBER BLANC: Have you ever cited one for having levels above 5 ppm?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: I don't know.

PANEL MEMBER BLANC: Have you ever cited one for not using a respirator?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: Yes.

PANEL MEMBER BLANC: So perhaps the statement that -- so this business about the breathing -- the self-contained breathing apparatus, that occurs not in the summary statement but somewhere in the body of the report?

DR. LIM: I don't understand.

PANEL MEMBER BLANC: Do you have -- you've read us the language of the -- the revised language of the summary. But this finding seems to relate not to the summary statement but to the body of the report. And somewhere in the body of the report there's something about wearing a self-contained breathing Apparatus.

DR. LIM: Yes, it --

PANEL MEMBER BLANC: Can you read us that sentence as it is in the current report? Is that hard to find?

PANEL MEMBER HAMMOND: Page 58 of the old one.

PANEL MEMBER BLANC: It should be on page 58 of the old report.

CHAIRPERSON FROINES: I have a question. I don't think any of this is appropriate. This Panel is not established to do occupational exposures. This refers to an occupational exposure.

PANEL MEMBER BLANC: Well, except that if they're violating the occupational law, it's going to get out, and then it is relevant.

PANEL MEMBER HAMMOND: Yeah, the assumptions for the bystanders --

CHAIRPERSON FROINES: Well, then it should say that.

PANEL MEMBER HAMMOND: But the assumption of the

bystanders are based upon --

PANEL MEMBER BLANC: Well, that's what I'm trying to get at. I mean I'm working my way up to that.

CHAIRPERSON FROINES: This silliness about self-contained breathing apparatus and whether people wear it or not is not within the purview of --

PANEL MEMBER BLANC: Well, that's why I was getting at the point, if they've been citing people for being over --

CHAIRPERSON FROINES: I understand.

PANEL MEMBER BLANC: -- then their presumption is probably weakened that there's never overuse.

PANEL MEMBER BYUS: Well, the overuse argument that they made -- I hate to bring this up -- was that it's very expensive. And so there's sort of an additional pressure not to overuse this compound because it's very expensive. But that's what --

PANEL MEMBER HAMMOND: That was true of vinyl chloride -- that was actually the argument with vinyl chloride and also mercury in --

PANEL MEMBER BYUS: Right.

CHAIRPERSON FROINES: I mean I think it's fair to say, since at least three of us have spent much of our careers in occupational health, that this notion that people wear these self-contained breathing apparatus so

you don't go above 5 is fanciful, to say the least. I mean it just -- it's just not the way the workplace works.

PANEL MEMBER BYUS: So what is your pleasure about this statement now?

PANEL MEMBER BLANC: Well, I think --

PANEL MEMBER BYUS: Because I don't have a consensus of it. I don't know whether anyone else does.

PANEL MEMBER BLANC: Well, one thing is that I wouldn't want to be approving a document which in its body says something about how great it is because nobody's ever exposed over 5 ppm. Because if they were, they would have to wear a respirator. And, therefore, they aren't because -- you know, so -- and so that should --

PANEL MEMBER BYUS: We'll take care of that. I've got that.

PANEL MEMBER BLANC: -- be out of the body of the document. Or -- yeah, well I would actually like to see the body of the document if there are data on the number of violations that occur per year in application that are violations related to potential overuse or over exposure, since that's directly relevant to how much then could leak out of the buildings. Those data should be summarized in the body of the document, not through a table or through some lengthy thing, but they should be -- it should be alluded to, I would think. And similarly, if there are

500 inspections a year and of 500 there have only been three per year where it's been found that there's been overuse, I think that would be quite reassuring also.

DPR ASSISTANT DIRECTOR JONES: This is Tobi Jones.

Lori, help me out here. But, Paul, I don't believe that in our risk assessment documents we go into the enforcement detail of our program as it's exercised with our county agricultural commissioners. So I think the kind of -- I mean what Randy has told you is in fact, yes, there have been citations of structural pest control operators regarding the use of this material. But it's not something that we go into detail on in our risk assessment documents.

PANEL MEMBER BLANC: Typically I could see why that would be not that relevant. Because, for example, for agricultural applications you have data at the margins of the fields and so forth. But here if much of the argument on low risk of exposure is predicated on the presumption that applications are being done appropriately, under the scenario of appropriate application the bystander exposure risk is such and such. And you have data on the other hand which indicate that in fact there is minimal or there is frequent misapplication. I would say that in this particular model it's more

relevant than it might be in other pesticides where you don't generally get into enforcement issues. So here I'm not -- I think the relevance of the enforcement data is how much does it support your presumptions of --

CHAIRPERSON FROINES: Hearing you talk and hearing Tobi, I think we should drop anything from the report and anything from this discussion -- finding about any assumption about 5 parts per million.

PANEL MEMBER HAMMOND: Well, that's what my original point was, to go back -- is to say that there is no place for such an assumption, especially when the assumption is based on the fact that you're not supposed to do it. Children don't watch more than one hour of TV a day because they're not supposed to. So I mean --

PANEL MEMBER BYUS: No, no, no, no. They've -- no, no. They've modeled this and measured it and they're all -- all the exposure's all modeled. I mean they've just done a few experiments here.

PANEL MEMBER HAMMOND: No, I under --

PANEL MEMBER BYUS: And then they do it and it's 5 parts per million, and that's what they're saying: If you do it properly this is the way it is. But that goes for every aspect of exposure --

PANEL MEMBER HAMMOND: No, no, no, no, no, no. That is -- they went beyond that. They actually had in

places in the document -- and I didn't mark them when I found these before, but there were places where the statements were made that they assumed it didn't go above 5 ppm because that was the standard. And that's not -- I understand if you do a modeling and you get an assumption. That's not my concern. My concern at the moment -- we could talk about the concerns of that modeling. My concern is the -- what I think is a fallacy of making an assumption that people never go above where the recommended levels are. In fact, the assumption was because the label said it wasn't supposed to be above 5 ppm. And that's not sufficient reason to assume it doesn't go above 5 PPM.

PANEL MEMBER ATKINSON: Then all the exposures, we'll just scale with whatever the value really is, which means that the report is meaningless.

PANEL MEMBER HAMMOND: And then if they have no data -- I think what happened was -- you know, I would agree, they should work from what was really there. My understanding from the last meeting was that the answer was there was no data whatsoever in those areas. And I think at that point you need to say there is no data. When there's no data, you say that. You don't make an assumption.

PANEL MEMBER BYUS: Well, in reality what you're

saying is that you ought to monitor, measure how many parts per million in every house after you take the tent off or whatever --

PANEL MEMBER HAMMOND: That's not what I'm saying.

PANEL MEMBER BYUS: -- before you let people back in. That is not what is done.

PANEL MEMBER HAMMOND: That's not what I'm saying. I'm saying don't make an assumption that something is true because you -- if there are no data -- and I understand when there are no data -- then just say there are no data. But don't make an assumption, because I think that's very dangerous.

PANEL MEMBER BYUS: And we will go back over --

PANEL MEMBER HAMMOND: And as a corollary to that, then I might also say I'd like them to start making measurements. But that's a secondary thing. The first thing is don't say something -- don't give a value that you have no data for.

PANEL MEMBER BYUS: Okay. We will make sure -- we'll check that point carefully.

CHAIRPERSON FROINES: Well, this 7 I think has to go.

PANEL MEMBER HAMMOND: Yeah, I don't think 7 -- I hope that we don't need to have 7 in there.

CHAIRPERSON FROINES: This is an occupational statement.

PANEL MEMBER HAMMOND: Well, it's not -- actually, first of all, John, there are lots of occupa -- if you were to go back to the document, it's full of occupational exposure data.

CHAIRPERSON FROINES: Oh, that's part of the problem we have.

PANEL MEMBER HAMMOND: Well, I mean -- well, I'm not even convinced that's part of the problem. That's a different issue, but that didn't come up before. But there's a huge amount of the documents about occupational exposure and worker exposure. So that I disagree with you on.

But I hope that Point 7 will totally disappear, because it will have been -- the concerns will have been incorporated into the final report. And I say that not because I want to win my battle, but because I'd like the report to be as accurate as possible. And I think that's to everyone's benefit.

PANEL MEMBER BYUS: Okay. So let make sure I've got this correct. Although this is all exposure. I don't why I'm talking about it, because I don't know much about it.

(Laughter.)

PANEL MEMBER BYUS: But I will.

(Laughter.)

PANEL MEMBER BYUS: Because I didn't -- I want you to know I didn't read it all. If nothing else, I found it fascinating.

So we will correct the language about the 5 parts per million exposure, make sure that it's very carefully understood where that was modeled data and where it is assumptions. And if it's assumptions, we were not going to use it.

PANEL MEMBER HAMMOND: And sometimes it's not modeled -- it's not even modeled.

PANEL MEMBER BYUS: Well, we're going to go take another look at that.

And the other thing is we will insert theoretically into the report, hopefully, both -- this is now report, not findings. We will -- you know, I believe in Paul's discussion here about some understanding of the numbers of violations per year related to overuse and inspections, because that would implicate that assumption.

CHAIRPERSON FROINES: I think Tobi's saying that that's not an option.

PANEL MEMBER BYUS: You're saying that's not an option?

DPR ASSISTANT DIRECTOR JONES: This is Tobi

Jones.

No, I didn't say that's not an option. I said incorporating enforcement data in to our risk assessments is not normally what we have done. That's all I said.

And I would really have to -- and I don't know if Lori or Randy have a handle on this -- really have to go back and ask what kind of data is available. Because these kinds of enforcement actions are taken at the county level.

PANEL MEMBER BYUS: Okay. If data are not available, we won't -- or it's inappropriate, we won't put it in. But I mean I think some discussion of the assumption that it's 5 parts per million ambient is implicit -- or more than implicit is required, clear language in the body of the report.

CHAIRPERSON FROINES: I don't understand. I'm sorry. I don't understand. I think that the assumption of 5 parts per million, that it never goes above that is fallacious and that there is -- unless there is an evidentiary basis, I don't see the reason that we should get into saying that that assumption is appropriate. There is no -- unless there is an evidentiary basis, it becomes speculation. And somebody can argue with me and say that that's a reasonable speculation, that's one thing. But I think that we should go on the science that

we have before us, not upon the speculation that something never gets above -- I mean we know in occupational health settings that things go above what people say they should be all the time. That's why we have OSHA.

PANEL MEMBER BLANC: Yeah, I think everybody's in agreement with that.

PANEL MEMBER BYUS: I understand.

PANEL MEMBER BLANC: I think -- I don't think that's what he was just saying --

PANEL MEMBER BYUS: I'll have to go back and look at the exact language throughout the document and how it applies.

CHAIRPERSON FROINES: It seems to me that the exposure should reflect the measured exposures that have been determined and not be based on necessarily a 5 part per million modeling, because I don't think it's valid. So I think what I'm saying -- Paul may say you all agree. But I'm saying that in sections 8, 9 and 10, those need to reflect experimental data from which conclusions can be drawn as opposed to an assumption, that I think is an incorrect assumption, that nothing ever gets above 5 parts per million.

DR. LIM: This is Lori. Can I make a comment?

Usually that the -- the problem with sulfuryl fluoride is that we already have registered uses. And

notice was -- say something about the risks associated with the use. That's why we have the -- we say an assumption that assume exposure. But if we just go ahead and say we don't have data for that use, and then the risk would not be calculated for that use and then there would -- you know, then what do you do the step after that? So at least at this point we could say if everything is done by label, we have this risk, and then it's not good. So -- in fact, the label is too high, so we need to work on getting it down. So it does give you some idea of what the risk is out there.

PANEL MEMBER BYUS: Shall we keep going here? Or anyone have any --

CHAIRPERSON FROINES: You say the estimated acute exposure for bystanders exceeded 1/10 of the reference concentrations and, thus, would meet the criteria established by DPR for listing under AB 1807.

When you say that they exceeded 1/10 of the reference concentrations, what is that based on?

DR. LIM: Is that a question to me?

CHAIRPERSON FROINES: Yep.

DR. LIM: Oh. Because the criteria is 1/10 of the reference concentration that -- I guess we decided that's the limit. And we want to be tenfold lower than the reference concentration for a chemical to be listed.

CHAIRPERSON FROINES: I understand all that. But I'm asking you: What was the basis of the statement, the estimated exposure concentration -- acute exposure for bystanders exceeded 1/10 of the reference concentration. What was the basis for that determination? Because that's the basis upon which this is being recommended as the TAC.

DR. LIM: Okay. I understand. See, the bystander for the structural is based on monitoring data. The non -- the only function with a 5 ppm was when we're talking about the non-fluid use commodities fumigation in which we don't have monitoring data.

CHAIRPERSON FROINES: Well, if the -- if the basis for recommending this as a TAC derives from monitoring data, then that's the data that forms the basis for the decision and that's the central data in terms of our finding.

If model data based on a 5 part per million is not part of a decision matrix, then that's not relevant to this particular determination?

Am I wrong?

You don't know what I'm saying?

PANEL MEMBER HAMMOND: Huh-uh.

CHAIRPERSON FROINES: We're in to a lengthy discussion about this 5 part per million estimate of theirs. And I'm saying that the -- on number 18 --

PANEL MEMBER HAMMOND: What number 18? Findings.

CHAIRPERSON FROINES: Point 18.

See, there has -- the decision -- this is something that leads you to a decision. That's what the findings are. And it says here under 18, "The estimated acute exposure for bystanders exceeded 1/10 of the reference concentrations and thus would meet the criteria established by DPR for listing under the AB 1807 Toxic Air Contaminant Program." Are you with me?

PANEL MEMBER HAMMOND: (Nods head.)

CHAIRPERSON FROINES: Okay. That is the decision, that's the fundamental decision that we are speaking to. The exposure -- because even though we may disagree with the MOE, that's what exists. And what they're saying is that the basis for the recommendation of it being a TAC is that the acute exposure exceeded 1/10 of the reference concentration. And what she -- Lori just said is that's based on monitoring data, that's based on actual exposure assessment.

PANEL MEMBER HAMMOND: Well, there's a lot of monitoring data in here.

CHAIRPERSON FROINES: That's my point. My point then is that when we have findings that relate to the exposure aspect, it should reflect that information that ultimately leads to the decision. And anything else based

on modeling assumptions should not be included.

PANEL MEMBER HAMMOND: And I keep wanting to correct it. It's not a modeling. I'm not objecting to modeling anyway. We're not talking about modeling data. I'm objecting to assumption data -- assumptions. Non-data --

PANEL MEMBER BYUS: I got you.

PANEL MEMBER HAMMOND: But, John, I agree with you.

CHAIRPERSON FROINES: What I'm saying is that 8, 9 and 10 should reflect the data that is used to make the decision.

PANEL MEMBER ATKINSON: Well, in 8, but it's true if you took out the first sentence.

CHAIRPERSON FROINES: Okay. Good.

In other words, the question is: What are we using the information in 8, 9 and 10 for besides -- is this not a -- we're not writing an encyclopedia. This is a process to which we come to a conclusion.

So the question is -- where we've got three major paragraphs here about exposure. But where does it lead to? What does it ultimately lead to in terms of the ultimate conclusion?

And why then, if it doesn't go somewhere, if it's -- we have to decide what factual material has

relevance and why.

For example, it says that -- on the bottom of 8 and 9 it says, "Estimates of air concentrations following use of sulfuryl fluoride at the maximum allowed application rate of 160 grams per meter^3 were estimated by multiplying the estimated sub-maximal air concentrations by ten." I have no idea what that has to do with anything that leads us to defining this as a toxic air contaminant. Is that information of value? I don't think it is. But I don't -- I'm maybe missing something.

And the same kind of estimates of air concentration in part 10, talks about 160 grams per cubic meter were estimated when multiplying blah, blah, blah. I don't know why we have that in there.

PANEL MEMBER ATKINSON: Well, the first part in each one as the measured data are at 16 grams per cubic meter. And everything is taken to scale with the application rate. And the 160 is the maximum allowed.

Am I correct?

PANEL LIAISON BEHRMANN: That's correct.

Dr. Froines, the point being made there was that the measured -- the monitored values were from experiments or applications where a lower than maximal application rate was used. In other words, the potential for public exposure could be much greater.

PANEL MEMBER ATKINSON: Than those measured values.

PANEL LIAISON BEHRMANN: Than those measured values.

PANEL MEMBER ATKINSON: By about an order of magnitude.

CHAIRPERSON FROINES: Okay.

PANEL MEMBER BLANC: But are --

CHAIRPERSON FROINES: I'm still asking the same question. Of those three paragraphs, what is it that leads you to your final conclusion? Because we need to highlight -- we need to highlight the information that we consider the most relevant for the ultimate determination. Otherwise it's a series of facts, which I think all may be interesting, but they don't help me say -- so when I get to number 18, I don't know from 8, 9 and 10 where 18 comes from, and nobody in this Panel can tell me where it came from.

PANEL MEMBER BLANC: John, I suggest we take a slight break from our transcriptions.

CHAIRPERSON FROINES: We will. But I want -- I just -- Roger and Craig, I don't know how you get to 18 from 8, 9 and 10.

PANEL MEMBER BYUS: I didn't write it.

PANEL MEMBER HAMMOND: May we take a break?

CHAIRPERSON FROINES: Yes. Let's take a break.

(Thereupon a recess was taken.)

CHAIRPERSON FROINES: Stan's not here, but we'll go ahead without Stan.

So am I right to assume that we're leaving paragraphs 8, 9, 10 and 11 to Craig and Roger and out of that -- and Joe.

PANEL MEMBER LANDOLPH: No, I just want to ask a question, when you're leaving a 10 --

CHAIRPERSON FROINES: And Kathy then should give any comments that she thinks are appropriate to Craig and Roger after this meeting. And so that -- and of course anybody else can too.

Go ahead, Joe.

PANEL MEMBER LANDOLPH: Yeah, I'll give them a comment too. And I just wanted to make sure it was appropriate.

At the end of 8 I just thought of putting a sentence in there to the effect that people really shouldn't go into these houses until the concentration of this material is down to below .25 parts per million, which would take about three days to flush it out. I'm just concerned about people going into the houses when it's around 5 parts per million. It's way, way too high. So I was thinking about putting a sentence for them in

there to that, if that's appropriate.

PANEL MEMBER HAMMOND: Well, maybe -- that almost --

CHAIRPERSON FROINES: It's not risk assessment.

PANEL MEMBER LANDOLPH: Well, I'm concerned because of the neurotoxicity and also possible carcinogenicity of this material.

CHAIRPERSON FROINES: Well, I think that we've never in our findings have given instructions for what people should do. We basically evaluate the science. We don't necessarily give the prescriptive approach to how one should deal with diesel exhaust, for example. We don't say people shouldn't, you know, go into a train yard and stand next to a locomotive -- I mean -- because of those exposures.

So that to the degree that we become prescriptive, we're -- I'm not convinced it's within our -- I think it's moral and ethically okay. But I'm not sure it's within our purview.

PANEL MEMBER LANDOLPH: Well, I was dealing with the former.

CHAIRPERSON FROINES: I understood.

What do you think?

PANEL MEMBER BLANC: Well, first of all, it can't be a finding if this -- unless there's a body of

evidence -- if there was evidence in the report which says -- if the report said it is dangerous to be in exposures even below those levels which are prescribed or if there were findings -- if there was data in the report that was relevant to the comment, then there could be a finding which summarizes, you know, that part of the document and states whether we think the science supports the statement. But if the report doesn't have data that's relevant to that, then there can't really be a finding related to that. There could be a finding that there seems to be a lack of data in a key area relevant to what transpires in exposures in a certain range.

PANEL MEMBER LANDOLPH: Well, the carcinogenicity data's admittedly thin. Just the fact that there is some I find a little bit worrisome --

CHAIRPERSON FROINES: But that's so thin for fluoride.

PANEL MEMBER LANDOLPH: -- going back 5 parts per million.

CHAIRPERSON FROINES: I think the fluoride's going to turn out to be more --

PANEL MEMBER BLANC: Well I think it's a separate question about how you would -- how the findings are going to approach -- as I understand it, it's a bit complex about how the findings are going to approach or not

approach the issue of carcinogenicity. But I probably would link that with the reentry question.

CHAIRPERSON FROINES: I just think one thing, Craig, that's very important, and we'll come to this, is that what comes out of 8, 9, 10, and 11, which is quite lengthy, there needs to be out of that perhaps a paragraph, because 18 says the estimated acute exposure for bystanders exceeded 1/10 of the reference concentrations. But we don't know what -- where that comes from. So it's too vague. There's no connection between the sections, and so that's -- and I think that -- that should -- Paul's -- in that respect, that has to come out of the report. So it has to also be in the report very clearly stated so we see what the logic for the decision is.

Am I okay on this?

So we're now over to --

PANEL MEMBER BLANC: -- 12?

CHAIRPERSON FROINES: -- Point 12.

PANEL MEMBER BYUS: I think we were going to insert the table, either figure 25 in Lori's presentation, or the OEHHA Table 1, which lists the reference concentrations and gives a lot more -- it's actually quite -- either -- they're both fine.

CHAIRPERSON FROINES: I would vote for the OEHHA

one.

PANEL MEMBER BYUS: The OEHHA. I was going to say -- I couldn't find it the other day. I did find it. I think I like the OEHHA one better as well.

CHAIRPERSON FROINES: Well, the good thing about the OEHHA is that it gives an NOEL and it gives an RFC.

PANEL MEMBER BYUS: Right. So I would suggest that we put that in the findings because it does -- it's very well done, very clear. And plus it has a lot of the assumptions in the bottom of it in the legend.

PANEL MEMBER BLANC: And it's a table which is in the report?

PANEL MEMBER BYUS: No, it's in OEHHA's --

PANEL LIAISON BEHRMANN: -- it's in OEHHA's findings, which are --

PANEL MEMBER BYUS: -- OEHHA's findings. And then they pulled the data out of the report and summarized it I think quite well. So I mean it's all in there. It's just in there in various places.

So I think the OEHHA table we will reinsert into the findings, such that it will make -- and the rewrite, those 8 through --

CHAIRPERSON FROINES: I don't understand one thing though. It says here -- under the DPR table you have one duration, one to two weeks, and it says the

critical NOEL is 100 parts per million. And is that consistent with the OEHHA 7.2 milligram per kilogram data?

DR. LIM: Excuse me, John. That point -- actually you don't want slide 25, because that talks about the repeated exposures.

CHAIRPERSON FROINES: I'm sorry?

DR. LIM: Slide number 25 in my presentation, that doesn't have any acute information in there. My presentation actually I laid out the acute toxicology information from the repeated exposure information.

CHAIRPERSON FROINES: I have no idea what you're talking about, and neither does anybody else.

PANEL MEMBER BYUS: No, I understand what she's saying. It's -- we'll make sure that everything is consistent. Everything is consistent to my reading of it between OEHHA and DPR. It's just -- it's very complicated about all the different exposure scenarios.

CHAIRPERSON FROINES: Well, the problem that I had is you can't decipher one table from another when you look at them. So that all I wanted to make sure was that we were -- that both agencies were consistent with respect to the numbers.

DR. LIM: If you want a table with the NOELs, the sort of air concentration, then the OEHHA Table 1 is the best use. If you only want NOELs and reference

concentrations, there's Table 18 in the RCD that can be used.

CHAIRPERSON FROINES: I don't know what that is.

That's not what we have, right? That's in the document.

DR. LIM: Yeah, that's in the document.

CHAIRPERSON FROINES: Then, Craig, why don't you guys decide. I mean it looks like Table 1 here from OEHHA is fine. But if there's something that would amplify it, then go ahead and include it.

PANEL MEMBER BYUS: We will.

PANEL MEMBER BLANC: Point 12 -- are we at Point 12 now?

CHAIRPERSON FROINES: Yes.

PANEL MEMBER BYUS: I think I added --

PANEL MEMBER BLANC: Is this where you want your line moved to from your suggested Point 2?

PANEL MEMBER BYUS: Correct. I did add that "Are also lethal to human beings." But I can reinsert that statement.

CHAIRPERSON FROINES: I would take out the "at". I would just say, "The applied concentrations of sulfuryl fluoride sufficient to kill insects and rodents in tented buildings and containers are lethal to human beings." We don't need the "also," we don't need "these

concentrations," we don't need "at". I think it's more declarative, if accurate.

PANEL MEMBER BYUS: It's accurate.

PANEL MEMBER BLANC: And you don't mean just that there have only been three human fatalities?

PANEL MEMBER BYUS: Where does it say three?

PANEL MEMBER HAMMOND: It doesn't say three.

PANEL MEMBER BLANC: So you said several. So why don't you get rid of "several". It's just unintentional cases, right? I mean you don't try and imply three or four, right?

CHAIRPERSON FROINES: Where are you at, Paul?

PANEL MEMBER BLANC: The next sentence.

CHAIRPERSON FROINES: Oh, yes.

PANEL MEMBER BLANC: And then just in terms of the order of this -- well, first of all, its signs and symptoms. Hypotension is not a symptom. It's a sign.

But I would suggest you reorder it so that you talk about the nonfatal and then talk about the fatal at the end. It's not -- you know, it's a more logical progression. You have a sentence about what, you know, postmortem findings are.

PANEL MEMBER BYUS: Actually it's probably better to do it the other way around because the non-lethal and even in the better -- we probably ought to break out the

non-lethal and lethal completely.

PANEL MEMBER BLANC: Yeah, but I would move up the chain so you end with the lethal if you --

PANEL MEMBER BYUS: Okay. Well, then I'll have to rearrange both, move them completely.

PANEL MEMBER BLANC: Yeah.

And you have pulmonary edema -- I'm not sure what -- "Postmortem evaluations typically revealed severe pulmonary edema, respiratory and lung mucosa, and brain edema." So I would just say, "Postmortem evaluations typically revealed severe pulmonary and brain edema."

PANEL MEMBER BYUS: Okay.

PANEL MEMBER BLANC: And I would actually get rid of the word "hyperexcitability," because I'm not sure what that means.

PANEL MEMBER BYUS: Okay.

CHAIRPERSON FROINES: Have you finished 12?

PANEL MEMBER BYUS: Everybody okay with 12?

Thirteen?

CHAIRPERSON FROINES: See, Stan, this is what we felt like the day we did lead.

PANEL MEMBER GLANTZ: I'm sorry.

CHAIRPERSON FROINES: Now, you should -- you'll know what pain people were in.

PANEL MEMBER GLANTZ: But we had no choice.

CHAIRPERSON FROINES: Yeah, I understand.

PANEL MEMBER GLANTZ: At least you're not talking about where the commas should be.

CHAIRPERSON FROINES: Thirteen? I had one -- Craig, I only had one.

PANEL MEMBER BYUS: Sure, anything.

CHAIRPERSON FROINES: The next to the last -- the last sentence, it says, "The significant findings from reproductive and developmental toxicity..." And I added "studies".

PANEL MEMBER BYUS: Okay.

CHAIRPERSON FROINES: And that's all I had.

PANEL MEMBER GLANTZ: Gee, Peter just pointed out this is the same room we had the lead meeting in. Maybe it's something about the air.

PANEL MEMBER BYUS: All right. Should we move on to 14?

CHAIRPERSON FROINES: Yep. And we agreed that Table 1 from OEHHA should be the table.

PANEL MEMBER BYUS: Right.

CHAIRPERSON FROINES: But we're going to check on the report to see if there's anything that would amplify it.

PANEL MEMBER BYUS: Right. And Lori's data. I'll talk with her about what will give us a complete

picture between everything.

CHAIRPERSON FROINES: On 15, I added after Appendix B "of the report". I assume that that's what you were referring to.

PANEL MEMBER BYUS: Right.

CHAIRPERSON FROINES: And I'm not sure you need to say, fluoride ions (referred to as 'fluoride')." I think you can say, "Fluoride is a metabolite of sulfuryl fluoride." I don't think we need -- I think that that's reasonably clear.

PANEL MEMBER HAMMOND: That's what fluoride means.

PANEL MEMBER BYUS: I know. I just want to make sure they -- I took this language right out of the book.

CHAIRPERSON FROINES: Now, what --

PANEL MEMBER BYUS: And I've actually en route said fluoride is a toxic metabolite of sulfuryl fluoride. I mean no where in there did I actually say that fluoride was toxic.

CHAIRPERSON FROINES: And do you think this --

PANEL MEMBER BYUS: The review presented in the -- I mean this was a major thing that I asked DPR and Lori to do, was really put this -- and a discussion of fluoride toxicity in general and then a discussion, a comparative of the fluoride load that you would get from

various sources. I mean she did a marvelous job on this. I mean this is very, very well done, in my opinion. Very objective, very thorough, if you want to lead it. I mean she really did a great job on it.

So I mean I just think -- and it is an important issue. So I mean I think it's excellent in Appendix B, and we should refer to it as that. And if there's any other way you want to feature it here in my language, please do. I mean I didn't agonize over all the words. But I mean I think it's very well done.

PANEL MEMBER BLANC: This is consistent with previous approaches that we've taken, in particular -- I'm trying to remember the discussion we had on something where there were multiple roots of exposure. Do you remember what the compound was? There was a lot of potential dietary exposure and we had a very long discussion.

Jim, do you remember sometime in the last three years that something -- before ETS obviously. Is this sounding familiar?

PANEL MEMBER GLANTZ: Yeah. No, I remember the discussion. I don't remember the compound.

CHAIRPERSON FROINES: Well, we haven't done -- it could have been one of the OEHHA RELs.

PANEL MEMBER BYUS: Okay. You want to move on?

PANEL MEMBER BLANC: Yeah. The only thing I'd suggest, if you figure out what that was and if it's appropriate, it would be nice to cite that we -- you know, as with --

CHAIRPERSON FROINES: So 16 is a point of contention. And I don't know what's in the report about the NAS study and about the osteosarcomas.

Joe.

PANEL MEMBER LANDOLPH: So why not for 16 just make some -- I suppose it's a reference to the NAS report -- just reference the fact that fluoride has been shown to cause osteosarcomas in rats. And there may be some development in human data, and just let it go at that.

CHAIRPERSON FROINES: Well, the thing you -- again, in the attempt to be consistent with the report, you need to see what Lori's done on that in the report.

PANEL MEMBER BYUS: Right. Yeah, we will.

CHAIRPERSON FROINES: But why don't you be responsible for writing a sentence or a couple sentences. And basically what we're doing is saying there is some preliminary or existing data -- it's not very preliminary. Actually it goes back quite awhile.

PANEL MEMBER BYUS: Yeah, the data's -- I mean as I again -- now I'm beginning -- I've been ciphering my

notes here. It has a lot to do with -- I think most of the data comes from fracture rate data and fluoride concentrations in the diet. And out of that, has a lot to do with the age. And apparently these osteosarcomas occur in young children. It has to do -- I mean at least the increased incidents. I hadn't seen the clinical trial. It's actually done by Loma Linda, people in China. And there's -- the problem with fluoride is that it's one of these level phenomenon. If it's too high -- if it goes from being beneficial to being nonbeneficial as you compete with other ions, calcium, et cetera, for deposition in the bone.

And it's because it's so prevalent and it varies so much in the diet is what happens, depending on where the plants were grown, I believe. It's kind of variable. But that is where the human osteosarcoma data comes out of, that study, I believe. And --

PANEL MEMBER LANDOLPH: Well, why don't you write that part up.

PANEL MEMBER BYUS: But I've only heard this by word of mouth. I haven't -- I don't have the data. I've only heard this by word of mouth from someone at EPA that I've talked to about --

PANEL MEMBER BLANC: So what data are in the document? I guess that's the question.

PANEL MEMBER BYUS: Well, there is but -- NAS is doing a review of it, I mean in -- a very careful study, as per review, as best they can. And that data is apparently going to be released some time early next year.

PANEL MEMBER BLANC: So then it would be possible to craft a finding which says that we recognize that the data reviewed in the report on carcinogenicity are extremely limited, but --

PANEL MEMBER BYUS: No, it's not extremely limited. That data was reviewed extremely well. There is this other study --

PANEL MEMBER BLANC: Okay. So then you're going to --

PANEL MEMBER BYUS: -- which is primarily based on fluoride, which is clearly relevant here. But I have not seen -- I can't say the data is -- that there is -- then there's someone else's thesis data, which I haven't seen either.

CHAIRPERSON FROINES: The Harvard study.

PANEL MEMBER BYUS: Right.

PANEL MEMBER HAMMOND: And that's not published?

PANEL MEMBER BYUS: That is not published.

PANEL MEMBER HAMMOND: We went through that last time.

PANEL MEMBER BYUS: And I hate, you know --

PANEL MEMBER BLANC: Yeah, yeah. I understand.

PANEL MEMBER BYUS: It is of -- there is some question.

PANEL MEMBER HAMMOND: They're not releasing the --

PANEL MEMBER BYUS: Well, there's question, and I --

PANEL MEMBER BLANC: So all I'm asking is this: It's the direction of what you would -- of what the Finding 16 would be would be a comment on two things: One is that it would be a comment on what is stated in the report one way or another. And then it would also be a caveat saying that new data may or may not emerge, for example, through a pending NAS report. So Is that basically what -- so that the finding will not only allude to the document itself but to the potential for other data that are emerging? But what I think the finding should not comment on is in some way trying to directly review other literature that's not reviewed in the document.

PANEL MEMBER BYUS: Correct.

PANEL MEMBER LANDOLPH: And there's also that animal study from NIEHS, must be 20 years old now, where they got a dose dependent deduction of osteosarcoma. So it's the same cite.

PANEL MEMBER BYUS: But from fluoride?

PANEL MEMBER LANDOLPH: For fluoride.

PANEL MEMBER BYUS: From fluoride. And I don't know the -- I haven't seen that. And if you want to come --

PANEL MEMBER BLANC: No, but I don't think we should comment on that. I don't think we should -- I think it's enough to -- there should be a caveat there. You should comment on what's in the report. We can't have a finding on the outside literature. It's not out -- if you think so strongly that this report needed to review that literature, that's a different issue.

CHAIRPERSON FROINES: Does the NTP study -- is it in the report?

DR. LIM: Yes, it is, in Appendix 4.

PANEL MEMBER LANDOLPH: And then Lori reviewed it. Then she -- they've already --

PANEL MEMBER BLANC: Well, then to that extent --

CHAIRPERSON FROINES: I think it needs -- to the degree that it's in there, it needs -- we don't need to do a major review. We need to say basically that there is -- and the word -- say limited evidence of osteosarcoma associated with fluoride exposure, an NAS report will emerge next year to address the issue. And that's pretty much what we have to say, I think.

PANEL MEMBER BYUS: Okay.

CHAIRPERSON FROINES: I don't think we should get into a literature review. I think that's where -- I think we're all in --

PANEL MEMBER HAMMOND: Yeah, that makes me think -- people alluded to the multiple sources of fluoride and what percentage these might represent. To the degree we're going to bring issues like this up, maybe one of our findings should include that, something about what the potential -- you know, like is this potentially how much of a total --

PANEL MEMBER BYUS: It's too -- I mean in my opinion, it's too speculative to do it.

PANEL MEMBER HAMMOND: Okay, okay. I just --

PANEL MEMBER BYUS: I mean I really -- I mean I think it's just -- there's nothing to hang your hat on here. I think she really did a great job, an excellent job, if you read that -- it's worth reading over, because there's very little, you know, additive toxicity type data.

PANEL MEMBER HAMMOND: Is this in the new report?

PANEL MEMBER BYUS: No, it's in the original --

PANEL MEMBER HAMMOND: It is. Okay. Just don't remember it.

PANEL MEMBER BYUS: It's in the original that provides --

CHAIRPERSON FROINES: No, no, version.

But I think the report changed as a result of Joe's comments.

PANEL MEMBER BYUS: Right. Correct, correct, correct. No, the correct --

PANEL MEMBER LANDOLPH: Yeah, if they could put that in the appendix. She made a lot of changes.

PANEL MEMBER BYUS: She made a lot of changes.

So I mean it does actually give you a perspective of what the load of sulfuryl fluoride exposure would be versus total fluoride from diet and all kinds of other sources and tooth paste and whatever.

And it's very well done. And I think a statement -- I mean I would use the word "limited evidence," because I think that -- and that's -- I'm taking from you because I think that's probably correct. So I'll use that word, and reference the fact that an NAS report is forthcoming. I mean that's -- I do agree with you. I don't think we should really say more than that, because I really haven't seen the data. And I have no idea which way it's going to go.

PANEL MEMBER LANDOLPH: I agree with that. And I think there's -- you know, until there's replication of the NIEHS experiment or better human epi data I think there is some skepticism about the data, I think there is

some skepticism about the data. But it's a positive.

CHAIRPERSON FROINES: Well, I think -- I think we're all in complete agreement. I'll just make one side comment, which is: As a person who's deeply involved in the issue of acrylamide, it has become very, very controversial because it's in our french fries, right?

So that we're all -- so the level of evidence that's being required to demonstrate a positive conclusion is affected by the implications of the finding. And fluoride is clearly right centerpiece in that. I mean there -- with methylene chloride we went on the basis of one NTP study. And here there are a lot of studies, but nobody's said it, yes. And in part I think some of the decision may reflect the fact that we have fluoride in our water and toothpaste. And so this is an issue that really does need to get sorted out, because it has such immense societal implications.

PANEL MEMBER BLANC: Can we move on to Point 17?

CHAIRPERSON FROINES: Yes.

PANEL MEMBER BLANC: Point 17 was moved in this revision from something that was earlier up, right, in the first version?

PANEL MEMBER BYUS: No, I think I added it.

PANEL MEMBER BLANC: Well, there was something in the previous version --

PANEL MEMBER BYUS: I don't know. Did I add it? I don't know. No, maybe it was --

PANEL MEMBER BLANC: -- Point 3 in the previous version, "A recently approved new use of sulfuryl fluoride as a commodity fumigant was not evaluated in this report and, therefore, not included in this review." And that point was deleted. Was this in lieu of that?

PANEL LIAISON BEHRMANN: Yes.

PANEL MEMBER BYUS: There you go.

PANEL LIAISON BEHRMANN: Point 17 replaces the old Point 3.

PANEL MEMBER BLANC: So there was a --

PANEL MEMBER BYUS: I mean this is what I -- I wrote there is an anticipate -- I mean it is an anticipation -- it's just you do anticipate this, so I mean I'm not putting words in their mouth -- by DPR that there is an increased proposed use of sulfuryl fluoride --

PANEL MEMBER BLANC: It's an approved -- it's not proposed -- isn't it?

PANEL LIAISON BEHRMANN: It's actually approved, isn't it?

DPR ASSISTANT DIRECTOR JONES: Um-hmm.

PANEL LIAISON BEHRMANN: Yeah, it's approved.

PANEL MEMBER BLANC: And the document says that's it's approved?

PANEL MEMBER ATKINSON: -- use has been approved.

PANEL MEMBER BLANC: Okay. And was there a reason to take out the language that said it was -- this was -- this use however was not evaluated in this report?

PANEL MEMBER BYUS: No. Put it back in.

PANEL LIAISON BEHRMANN: Okay.

CHAIRPERSON FROINES: But my question is: In the report, Tobi, does it say that you anticipate higher exposures and lower margins of exposure than those calculated in a current risk assessment document? Is that an accurate statement from the report?

PANEL MEMBER BYUS: That's where I took it from.

DR. LIM: Yes. This is Lori. Yes, it is. The exact statement in the conclusion was that, "Furthermore, expanded uses in food commodity fumigation result in higher exposures and lower margins of exposures than those calculated in this OCD."

CHAIRPERSON FROINES: Do you give some reason for that conclusion? Do you give a justification in the report?

DR. LIM: It's discussed in the -- fact that there would be more uses and more frequent uses.

CHAIRPERSON FROINES: And that means that there will be more exposure necessarily?

DR. LIM: Yes.

CHAIRPERSON FROINES: Are you sure?

DR. LIM: More people would be involved in terms of -- not necessarily the highest level, but more people would be exposed and would probably go into repeated exposure scenarios.

CHAIRPERSON FROINES: All I'm saying is that when you make a statement that says there's going to be higher exposures and lower margins of exposures, there has to be a justification for that statement.

DR. LIM: Yes.

CHAIRPERSON FROINES: And that's all I care about, that we don't -- I keep -- I've said it two or three times today. I want to keep us away from being speculative in our findings. So we have to justify what we say.

PANEL MEMBER BLANC: What's a lower margin of exposure?

PANEL MEMBER HAMMOND: I think it -- is this -- this is the ratio of the exposure to the reference standard -- reference concentration?

CHAIRPERSON FROINES: What she's saying is I think is that it's more likely to exceed their MOE guidelines for risk. Is that correct?

DR. LIM: Yes. The equation is MOE equals to the NOEL over exposure.

CHAIRPERSON FROINES: Now, the fact that Paul didn't understand what that meant means that that should be changed to be a little bit more clear.

PANEL MEMBER BLANC: Explicit. I would just explicitly say what you mean.

CHAIRPERSON FROINES: Yeah.

PANEL MEMBER BLANC: And when you say higher exposures, you mean -- first of all, based on what your verbal comments -- you mean greater numbers of persons exposed. Does higher exposures also mean greater peak exposures for those that are exposed? Or does higher exposures mean greater numbers of persons exposed?

DR. LIM: I think both cases could be possible.

CHAIRPERSON FROINES: Well, we just need to make sure it's in your report --

PANEL MEMBER BYUS: It's in there.

CHAIRPERSON FROINES: -- and justified.

PANEL MEMBER HAMMOND: Also, back to the MOE. I was wondering what the reference concentrations were. It would seem to me that it would be appropriate in the finding, to be explicit as to -- because there are multiple ones that could be used. You may as well be explicit that you're using this one.

CHAIRPERSON FROINES: Are we ready to move on?

PANEL MEMBER BYUS: No.

CHAIRPERSON FROINES: No?

PANEL MEMBER BYUS: Hold on. Give me a minute.

PANEL MEMBER BLANC: I think if I'm going to be consistent with John's earlier comments, the last line of this point, which is "This aspect should be considered in the regulation" --

PANEL MEMBER BYUS: You should drop it.

PANEL MEMBER BLANC: Yeah. What I think our findings should be is that there should be a supplemental -- yeah, either supplemental measurement or -- and we'd be happy to, you know, review data. We look forward to reviewing data -- relevant data, whatever it is. But not, you know --

CHAIRPERSON FROINES: I think we're talking here about subsequent characterization of exposure, not regulations.

PANEL MEMBER BYUS: I think we should just leave it as -- take that last sentence out and leave it, because I think it makes the point.

PANEL MEMBER BLANC: That's fine.

PANEL MEMBER BYUS: I think we should leave it out. After listening to you this morning, John, I do believe it. So we'll just make the point.

PANEL MEMBER HAMMOND: Although it is -- if there's a new use and then -- new increased use, then

probably -- I don't see why it wouldn't be a finding saying that there's inadequate exposure data on this and that we urge them that they collect exposure data on the new use.

CHAIRPERSON FROINES: Well, you can put in a sentence that says additional monitoring when this new use is -- is it new use that's about -- so when the new use, you know, emerges, we should be careful to do monitoring of exposure.

PANEL MEMBER BLANC: I know that Point 18 is going the change in light of how, you know, 9, 10 and 11, or whatever it is, change. But --

PANEL MEMBER BYUS: Well, this is pulled directly -- I've added this -- pulled this directly out of the document, more or less from the conclusions. This is their conclusions. And I concur with all of them. And this is the way they state them, which wasn't in the original sort of draft findings. But it really gives you the understanding that it exceeds these MOEs in a whole variety of exposure scenarios, just not for one exposure scenario. So in all these different scenarios, we seize them.

PANEL MEMBER BLANC: Doesn't it say it did not meet the benchmark?

Am I misinterpreting what the whole last

two-thirds --

PANEL MEMBER BYUS: So for all these exposure scenarios it's dangerous -- it's not good. It's a problem is really -- that's what it means.

PANEL MEMBER BLANC: What is not meeting the benchmark?

PANEL MEMBER ATKINSON: Benchmark has to be greater than --

PANEL MEMBER BYUS: Benchmarks are greater.

Lori, are you over there?

DR. LIM: Yes, I am.

PANEL MEMBER BYUS: Could you explain this?

DR. LIM: Okay. The benchmark is like a line that we draw. So that we want the modern exposure to be greater than the benchmark. So anything that's less than the benchmark, that means there's a risk that we should be concerned about.

PANEL MEMBER HAMMOND: Actually this is a misuse of the term "benchmark".

CHAIRPERSON FROINES: Yes.

PANEL MEMBER BLANC: That's what I'm trying -- that's where I'm going with this.

DR. LIM: Well, that's -- I mean that's a term that we used in our document. And --

PANEL MEMBER HAMMOND: No, benchmark -- that's

not what benchmark means. The benchmark dose is a dose where you see something.

DR. LIM: I know. But we're not calling it benchmark dose. We just call it a benchmark.

PANEL MEMBER HAMMOND: Let's not use that word, because in this world it has a very specific and different meaning, and it's misleading. So you could say target.

CHAIRPERSON FROINES: Criteria.

PANEL MEMBER BYUS: Okay. Wait a minute now.

CHAIRPERSON FROINES: Use the word "criteria".

PANEL MEMBER BYUS: Where is this? So what sentence?

PANEL MEMBER BLANC: This whole last part, "The margin of exposure for the following scenarios and exposure did not meet the benchmark of 100."

PANEL MEMBER HAMMOND: And it shouldn't be benchmark. It didn't meet the target.

CHAIRPERSON FROINES: If it does not meet the benchmark, does that mean that it is problematic or not problematic?

DR. LIM: It is problematic.

CHAIRPERSON FROINES: Well, this -- then this -- you can read this both ways. It's very confusing.

PANEL MEMBER HAMMOND: But don't use the word "benchmark".

CHAIRPERSON FROINES: All right.

PANEL MEMBER BYUS: Well, what should we use?

PANEL MEMBER BLANC: All right. Well, the way you said it in the first sentence.

PANEL MEMBER BYUS: This is the -- look. First of all, this is how it is written in the document that --

PANEL MEMBER BLANC: All right. Well, I would suggest that you both --

PANEL MEMBER BYUS: Quote, word by word. So I just --

PANEL MEMBER BLANC: Right, right.

PANEL MEMBER BYUS: So if we want to change something, we should probably change the document as well, theoretically.

PANEL MEMBER HAMMOND: "The margin of exposure for the following scenarios and exposure duration did not meet the target of less than 100."

DR. LIM: And we want it to be greater than 100.

PANEL MEMBER HAMMOND: Oh, this is a margin.

Right. Okay.

PANEL MEMBER BYUS: So what is it, Kathy? I'm writing.

PANEL MEMBER HAMMOND: It did not meet the target.

PANEL MEMBER BLANC: Well, wait.

Okay. Can I just clarify something, why it's worded -- can you explain to me why it's worded the way it is in the first sentence -- the first sentence when it -- second sentence, it says, "The estimated acute exposure for bystanders exceeded 1/10 of the reference concentrations and, thus, would meet the criteria established by DPR for listing under AB 1807 Toxic Air Contaminant Program." I got that part.

Okay. So that's bystanders. It exceeded 1/10 of the reference.

"The margin of exposure for the following scenarios and exposure durations" -- I guess -- "did not meet the benchmark of 100 occupational" -- so is that -- what does --

PANEL MEMBER BYUS: Wait a minute. We're changing those words. What are the words now, "Did not meet the target of greater than 100"?

PANEL MEMBER BLANC: Is this a different way of getting at it than the 1/10 of the reference concentrations?

PANEL MEMBER HAMMOND: Yes.

PANEL MEMBER BLANC: So a totally different criteria, is that right?

CHAIRPERSON FROINES: No. It's just two ways of looking at the same thing. One is the MOE and one is the

reference concentration.

PANEL MEMBER BYUS: Depends on what data they have.

PANEL MEMBER BLANC: Okay. So the reference concentration --

PANEL LIAISON BEHRMANN: We will come up with a much easier --

PANEL MEMBER BYUS: First of all, this is their -- this is DPR'S exact language from the conclusions of the document. So we can --

PANEL MEMBER BLANC: So change it in both places.

CHAIRPERSON FROINES: But here's the issue. This is the findings of the Scientific Review Panel. And I -- I'll come back to DPR in a second. This needs to be able to be read by an intelligent person who is a member of the public and understands what being said. At this point, this paragraph isn't even clear to this committee. And so somebody in the back of the room who reads Scientific American, for example, should be able to understand this. And it's not clear. And so it needs to be changed.

Second is I'm not sure why we have workers in here. It's not within our purview.

PANEL MEMBER HAMMOND: The entire document has workers.

CHAIRPERSON FROINES: I understand it has

workers. But our findings don't -- we're the Scientific Review Panel that deals with environmental exposures. We don't deal with worker exposure. So why should we be having findings about workers? Can somebody explain that to me? I'm happy to believe in God and be for motherhood and apple pie and I'm for workers. But that's not within my legislative mandate. So why should I have it in my findings? Why should we have it in our findings?

PANEL LIAISON BEHRMANN: It's very easy to remove.

CHAIRPERSON FROINES: If somebody -- I mean I understand why one would want it emotionally. But I don't understand why one would want it legislatively.

PANEL MEMBER BLANC: Well, I think your point's well taken. It should be just taken out of there. Those scenarios are not relevant to our --

PANEL MEMBER BYUS: So you're saying to hell with workers, right, John? Is that --

(Laughter.)

PANEL MEMBER BYUS: Just teasing.

Don't type that.

No, no, no. That's okay.

CHAIRPERSON FROINES: When we -- when we're litigated, that's going to be --

(Laughter.)

PANEL MEMBER BYUS: All right. I'll -- this was a joke.

PANEL MEMBER GLANTZ: Yes.

PANEL MEMBER BYUS: You are correct. You are correct.

PANEL MEMBER BLANC: There's one other --

PANEL MEMBER BYUS: This is an unusual compound, you know, because of the way it's applied and because of the way it's handled and because of the way the risk assessment was done to include a variety of individuals that are likely to be exposed to it at the same times that other people are exposed. That's why it was included.

Had DPR not included workers and exposure scenarios for workers in this document, it would have -- we would have probably asked that question, "Well, what happens to the workers?" So the point that -- the reason they included it --

CHAIRPERSON FROINES: I wish it were as simple as what you just said. Because there is a point of disagreement between the SRP and DPR vis-a-vis risk assessments that include everything versus what we're -- what our mandate is. And so this is a complicated issue which we certainly don't want to even get within 100 miles of. But it is -- this isn't a trivial issue.

PANEL MEMBER BYUS: No. But I do think in this

case -- and I will say that -- I still think in this case it would have been very difficult for me to interpret this as the lead without the worker data. Whereas in other instances, I will agree with you, it's not necessarily. But in this case it provided the really appropriate framework to understand --

CHAIRPERSON FROINES: Can you imagine how long it would have taken us to have gotten through lead if we had workers in there as well.

PANEL MEMBER BYUS: No, but that's --

PANEL MEMBER HAMMOND: No, no. The point is -- the point is that worker data informs the emissions, which therefore inform the ambient exposures.

PANEL MEMBER BLANC: And I don't think John is saying take the worker data out of the document. Take it out of the finding --

PANEL MEMBER HAMMOND: So I think the data remain in the report, but they shouldn't be in the findings.

PANEL MEMBER BLANC: But --

PANEL MEMBER BYUS: Right. He's absolutely correct, as usual.

(Laughter.)

PANEL MEMBER BLANC: -- tangentially related to the workers you might want to consider if it can be easily inserted into one of the existing findings, since you talk

about it in the toxicity, that another group of exposed people aside from the bystanders and the residents are persons who go into -- non-resident intruders into residentially treated spaces. Which will become also quite relevant later on for the commodity uses, because you get other people exposed also who are not bystanders, in the way they're using the term "bystanders" here, and are not residents. And for those people of course the exposures more closely approximate and exceed the occupational exposures. That's why I thought of it in that context.

CHAIRPERSON FROINES: Okay. So, Craig, can you work with Lori and Randy and whomever Tobi thinks is appropriate to -- and Jim -- to get this clarified.

I do think that there needs to be a sentence about what is the estimated exposure that results in that estimated exposure conclusion. In other words, I don't -- what I'm saying is from what I hear, is that there are a number of different results, so it may be -- I don't know what I'm saying. What I'm saying is: Can there be some justification as a prior sentence to that conclusion that makes it more explanatory? So you see where either in the earlier sections or in this section where you see how it connects.

PANEL MEMBER BYUS: All right. And we wanted to

be able to be understood by someone who reads Scientific American; is that correct? We'll work on it.

CHAIRPERSON FROINES: I don't think I can understand Scientific American anymore, so it may be too high a standard, but we'll see.

PANEL MEMBER BYUS: We'll work on it.

CHAIRPERSON FROINES: We're about to lose Paul and we're going to lose Gary.

And I think we're done with Vikane for the day. And so we'll finalize it at the next meeting.

PANEL MEMBER BYUS: Thank you.

CHAIRPERSON FROINES: And, you guys, I'm sorry that there's a lot of work left to go.

PANEL MEMBER BYUS: That's fine.

CHAIRPERSON FROINES: I think it's clear what has to be done.

Thanks Paul. Thanks, Gary.

Stay as long as you want.

PANEL MEMBER FRIEDMAN: Well, no, this would be a good time.

CHAIRPERSON FROINES: Can I -- thanks, Tobi. I hope it wasn't too painful.

DPR ASSISTANT DIRECTOR JONES: Instructive.

CHAIRPERSON FROINES: It was all friendly and well meaning.

Here's my question. It always happens, doesn't it, that you assume that everything's going to be a slam dunk and it could take five minutes and you're going to be out of here by 10 o'clock, and it never works.

And so -- I don't know who is -- oh, George is back there, or Melanie is here. We've lost two people.

Melanie, what do you think about -- let's -- why don't we do gasoline and maybe hold -- I hate to have Paul and Gary not here for the children's. Would that really be a problem for you if we didn't take up children?

OEHHA SUPERVISING TOXICOLOGIST MARTY: That's fine. Whatever you want to do is fine.

CHAIRPERSON FROINES: Well, the children's -- everybody was so interested in the children's thing, I hate to have -- but I'm ready to stay here for the duration, and I think everybody else is. So what does the Panel think?

OEHHA SUPERVISING TOXICOLOGIST MARTY: Well, just to comment on the children's health update, we're -- from OEHHA's perspective, we wanted to lay out what you folks are going to see coming down the pike in terms of peer review of documents related to implementing SB 25. So it would be nice if Gary and Paul were here to hear that.

CHAIRPERSON FROINES: How long do you think that would take?

OEHHA SUPERVISING TOXICOLOGIST MARTY: My presentation could be pretty fast.

I mean we could do it next time, you know, because --

CHAIRPERSON FROINES: Well, why don't we do it this time. I mean maybe I'm --

PANEL MEMBER GLANTZ: Let's do that. And if you could -- they can be brief.

CHAIRPERSON FROINES: And we can brief them.

PANEL MEMBER GLANTZ: Because somebody else will not be here next time.

CHAIRPERSON FROINES: You know, if it's a -- it's obviously descriptive, and so it's going to be no more than a half hour to an hour, I would guess.

OEHHA SUPERVISING TOXICOLOGIST MARTY: Oh, much less than that. Yeah, much less time than that. We could tack it on after --

PANEL MEMBER GLANTZ: With respect to the DPR side --

OEHHA SUPERVISING TOXICOLOGIST MARTY: They're laughing.

PANEL MEMBER HAMMOND: That's before we start talking.

PANEL MEMBER BYUS: This is Panel time, right? Panel time, half an hour to an hour, yeah --

CHAIRPERSON FROINES: Well, let me ask you question.

PANEL MEMBER GLANTZ: That's how close to the speed of light you're moving.

(Laughter.)

PANEL MEMBER GLANTZ: We should proceed.

CHAIRPERSON FROINES: I would like to ask a subsequent question, which is: How long do you think -- and this one I think is hard to predict -- how long do you think the gasoline is going to take?

OEHHA SUPERVISING TOXICOLOGIST MARTY: That might be an hour.

CHAIRPERSON FROINES: An hour. And so we're talking about an hour and a half from now.

And so the question I have for the Panel is: Do we want to break for lunch now and come back or do you want to work through lunch?

PANEL MEMBER BYUS: As long as I make my flight.

PANEL MEMBER GLANTZ: Is there any way to get lunch?

PANEL MEMBER HAMMOND: We just have it brought in.

PANEL MEMBER GLANTZ: So just have -- I mean are you -- maybe Peter can do his thing and get us some sandwiches and we can just work all through lunch.

CHAIRPERSON FROINES: Is that possible?

MR. MATHEWS: Yes.

PANEL MEMBER BYUS: I would suggest we continue to work. Because otherwise we won't make our air flight.

CHAIRPERSON FROINES: Okay. Let's take a five-minute break. And Peter can talk to each person and -- Peter can see if there's a sandwich option, in which case people can tell him what they want. And then we can proceed.

Is that all right?

That will give you a break as well.

Five-minute break.

(Thereupon a recess was taken.)

CHAIRPERSON FROINES: We will reconvene the meeting officially.

I know that was painful, but I think this document will end up being -- the findings and the document will end up being improved.

I don't know who's starting. Sara?

George.

OEHHA DEPUTY DIRECTOR ALEXEEFF: Hello. I'm George Alexeeff of the Office of Environmental Health Hazard Assessment.

So I thought I would just provide some context for this report that we're presenting today. You know,

when the Toxic Air Contaminant Program was --

CHAIRPERSON FROINES: George, let me just say one thing first.

I just have a question. Jim is not here. Do we have a quorum? Because Roger is not -- he's not counted as a quorum at this point.

No, because he's an author.

So we have 1, 2, 3, 4 -- 5. So we're okay.

But just so the Panel knows, that Roger is not part of the deliberation. He's part of the --

OEHHA DEPUTY DIRECTOR ALEXEEFF: -- presentation?

CHAIRPERSON FROINES: -- presentation.

PANEL MEMBER HAMMOND: He has a different hat.

CHAIRPERSON FROINES: So we can throw daggers at --

PANEL MEMBER GLANTZ: You mean me or Roger?

(Laughter.)

PANEL MEMBER GLANTZ: We'll treat Roger like Melanie.

CHAIRPERSON FROINES: Don't go there, Stan.

Let's go, George.

OEHHA DEPUTY DIRECTOR ALEXEEFF: Okay. So I'm George Alexeeff. I just wanted to give some context for this report.

You know, when the Toxic Air Contaminant Program

was started in the mid-eighties -- '84, '85 -- many of the first chemicals picked were those that were components of gasoline or gasoline emissions. And then when MTBE was found in a lot of drinking water, there was concern about, you know, whether it was an effective oxygenator and whether ethanol would be an effective oxygenator and its replacement. And a report was commissioned both to the University of California -- and also we were asked, that is to say, OEHHA, in combination with the Air Resources Board, to look at the relative benefits -- or health risks and benefits of ethanol in gasoline versus MTBE in gasoline. And we did that report. We brought it to this Panel.

In that report, we quickly found out that it would be very difficult to do a comprehensive evaluation of the health effects of gasoline. So instead, that report simply tried to compare the differences between a gasoline with ethanol versus a gasoline with MTBE, assuming many components stayed the same.

So at that time we also felt it was important, and we had some funding provided -- limited funding and some legislative approval, to proceed on a report to look more comprehensively at the health impacts of gasoline.

CHAIRPERSON FROINES: What year was the ethanol report?

OEHHA DEPUTY DIRECTOR ALEXEEFF: Well, it was finalized in the year 2000. But it was written in the year 1999.

CHAIRPERSON FROINES: I have no recollection whatsoever of that report.

OEHHA DEPUTY DIRECTOR ALEXEEFF: Yeah.

CHAIRPERSON FROINES: Well, we brought that -- Oh, I see. I guess the part you we -- you're right. I guess we brought that report. It was a Cal EPA -- no, I guess it was a UCOP, University of California Office of President review. But I think it was a special environmental -- Environmental Policy Council of the Environmental Protection Agency, which consists of the directors of the --

CHAIRPERSON FROINES: I remember the MTBE report that we approved.

OEHHA DEPUTY DIRECTOR ALEXEEFF: Right. And we -- and ours was similar to that. It was an MTBE and ethanol report.

CHAIRPERSON FROINES: Do you remember that, Stan?

PANEL MEMBER GLANTZ: (Shakes head.)

OEHHA DEPUTY DIRECTOR ALEXEEFF: Okay. Well --

PANEL MEMBER GLANTZ: I remember the -- I didn't remember ethanol being there.

CHAIRPERSON FROINES: I don't remember ethanol.

OEHHA DEPUTY DIRECTOR ALEXEEFF: Okay. Well, we brought MTBE to the Panel.

PANEL MEMBER GLANTZ: That I remember.

OEHHA DEPUTY DIRECTOR ALEXEEFF: Okay, as a unit risk in terms of evaluating the health impacts of --

PANEL MEMBER GLANTZ: Right.

OEHHA DEPUTY DIRECTOR ALEXEEFF: Okay. So possibly I've misspoken in terms of that report coming to this Panel.

In any case, we did prepare a report comparing the relative merits of ethanol and MTBE in gasoline. And it was from that where we felt it was more important to do a more comprehensive evaluation of gasoline.

So Dr. Sara Hoover, who was sort of the -- has been the lead of this project -- we started by having two workshops in -- one in northern California and one in southern California. The one in southern California was at UCLA and the one in northern California was in Oakland, where we got input from a number of stakeholders as to what issues we should be considering as we're looking at gasoline emissions.

And this is the first of, we hope, several reports where, first, we'll be looking at the -- in this case, the formation of pollutants and then we'll be looking at exposure assessment and then we'll be looking

at more health information on the particular components that we can find health information on and put a comprehensive report together.

As you can see, it's a --

PANEL MEMBER GLANTZ: Can I just ask one question about --

OEHHA DEPUTY DIRECTOR ALEXEEFF: Yes.

PANEL MEMBER GLANTZ: I mean this is not my total area of expertise. But when you were talking about this, were you talking about emissions of combustion products from burning gasoline or also gasoline evaporat --

OEHHA DEPUTY DIRECTOR ALEXEEFF: Both.

PANEL MEMBER GLANTZ: Okay. Both.

CHAIRPERSON FROINES: But -- well, he's going to explain.

OEHHA DEPUTY DIRECTOR ALEXEEFF: Ultimately that's the plan, yes.

As you can tell, it's a collaborative effort between OEHHA and the University of California at Riverside. Dr. Atkinson and Dr. Arey assisted us and gave us much of the information -- or most of the information for this report. So hell be assisting us in answering questions on it.

But I'll turn it over to Sara Hoover to introduce the report.

(Thereupon an overhead presentation was Presented as follows.)

OEHHA RESEARCH SCIENTIST HOOVER: Okay. Thanks, George.

So just to give you -- I'm going to give you a little bit of background and context for the report, and then Roger's going to talk more about the details in the report.

So as George was talking about, the project grew out of our MTBE and ethanol assessments. The concept is for us to try to evaluate the potential health risks associated with the exposure to gasoline-related pollutants in California.

And really this part of the project that we're talking about today is just the first step, which is identifying chemicals of potential concern. We're looking at the directly emitted chemicals that are known and some portion of the secondary products. We'll then proceed to review the toxicity of these chemicals, with a focus on chronic respiratory toxicity and carcogenicity. And, again, as George mentioned, we're going to attempt an exposure assessment for -- and we're interested in inhalation exposures, so we'll be looking at statewide averages and concentrations in specific air basins. And then ultimately attempt again to estimate risk by

combining available health assessment values such as unit risk values with the estimated exposure.

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OEHHA RESEARCH SCIENTIST HOOVER: So this particular report, the objective was to identify observed and predicted atmospheric transformation products associated with gasoline-related pollutants and assess the atmospheric lifetimes of gasoline-related pollutants.

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OEHHA RESEARCH SCIENTIST HOOVER: Now, because of the scope of the chemicals in gasoline emitted from gasoline combustion and evaporative emissions, we had to select certain chemicals. We couldn't look at everything. It's just -- the scope is just too large. So the basis for selecting the chemicals is laid out here.

We did it two different ways -- well, primarily two different ways. The first was a mass emissions ranking. So using ARB data and with input from ARB, we identified the gasoline-related chemicals that have been speciated in California Reformulated Gasoline Phase 2 and the associated mass emissions with those gasoline-related chemicals. And those were then ranked. And the top 25 chemicals were included in the atmospheric chemistry analysis.

Then we also did a screening of the

gasoline-related chemicals that we identified in the first part of the slide and looked for chemicals that had particular toxicological concerns: Carcinogens and potential respiratory toxicants. And then we also used expert nomination. For example, although we based the first part of this information on our RFG2, we wanted to look at ethanol because of future use of ethanol.

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CHAIRPERSON FROINES: Within that context then, the second bullet -- my concern is always when you go to a regulatory agency to ask them what to study, they tell you what they regulate. And so you end up focusing on the same kinds of substances. So I'm assuming that bullet 2 is where you actually went beyond --

OEHHA RESEARCH SCIENTIST HOOVER: Yeah, we did go -- that partly is why we're calling it preliminary tox screening, because what was done there was taking a list of something like 300 or so chemicals that have been speciated associated with gasoline and doing a screening using secondary sources and looking for evidence of carcinogenicity as well as chronic respiratory toxicity. Now, we did use sources like Prop 65, IARC, that -- things that are known. And then we used other sources like Score Card to identify potential toxicants, which we then did a little bit more research on to just try to pick out things

of interest.

But you are right, that you end up with a lot of chemicals that are known toxicants. However, that's just in the selection for atmospheric chemistry review.

So in the overall report we'll be looking at -- we'll be presenting the information on all of the chemicals and the screening that was done. And it will be shown -- in fact how limited the data are in terms of making such an evaluation.

So then just to briefly summarize from this report, there were 43 gasoline-related VOCs or classes of VOCs that were looked at. And from those there were 150 known reaction products identified and 100 -- about 140 additional predicted products. And then these approximately 300 products will be screened for toxicity and exposure data.

And I'm going to turn it over to Roger.

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PANEL MEMBER ATKINSON: Okay. Roger Atkinson, University of California at Riverside.

So the report is really in two sections. The first section is an overview of atmospheric chemistry. The second section, which is the longest of these, is actually an appendix which deals with the 43 chemicals or classes of chemicals.

So in the overview there's a discussion of the physical make up of the atmosphere, the potential loss processes or removal processes for organic compounds in the lower atmosphere, the troposphere; an assessment of the atmospheric lifetimes -- or actually an estimation of the atmospheric lifetimes and typical reactions of gasoline-related VOCs; a little bit of a mention on gas particle partitioning, which is mainly important for reaction products, although it does impact the PAHs and nitro PAHs.

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PANEL MEMBER ATKINSON: So there's a discussion of photolysis -- the potential loss processes for VOCs. The photolysis, which is really only -- appears to be only important for reaction products, at least out of those that we looked at in the appendix. Reaction with hydroxyl radical during -- mainly during daytime hours; nitrate radical during evening and nighttime; ozone, whenever it's around. And a discussion, fairly brief, of the physical removal processes ease of wet and dry deposition.

As you'll see later, the hydroxyl radical reaction is the dominant loss process of nearly all the organics we considered in the appendix.

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PANEL MEMBER ATKINSON: There's a discussion of

the atmospheric sources and concentrations of ozone; oH radicals; NO3 radicals; and some mention of chlorine atoms, which have been postulated as being potentially of some significance in coastal areas. We talk about -- or at least we mention seasonal and diurnal dependence of these concentrations of these species. So there's a reasonable good overall, fairly -- well, fairly brief, but still a concise overview of the atmospheric chemistry as regards the loss processes of VOCs.

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PANEL MEMBER ATKINSON: And so we use those data. It's the typical concentrations of ozone, OH, NO3, typical photolysis lifetime to calculate the VOC lifetimes with respect to each of those individual reactions and an overall reaction -- an overall lifetime.

And there's a table with all of these data in it.

And the calculations, as I mentioned, are based on assumed concentrations of radicals or in ozone.

There are measurements certainly of ozone, some measurements of OH, some of NO3, but they're essentially a global tropospheric average that was used. But you can readily calculate the -- recalculate the lifetime for any individual conditions that you want to and visit. Okay.

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PANEL MEMBER ATKINSON: So the loss processes of

the compounds looked at in both the appendix and discussed in the overview are alkanes, which react with OH radicals; alkenes, which react with OH, ozone and NO3; aromatic hydrocarbons, which react with OH; ethers, alcohols, carboxylic acids, which react with OH; and carbonyl compounds, which react with OH and undergo photolysis.

And there's a discussion of the atmospheric chemistry, fairly brief and concise, of each of these classes of compounds in the overview.

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PANEL MEMBER ATKINSON: VOCs by definition are essentially largely or totally in the gas phase. There is some mention of gas partitioning, it's important for reaction products, and obviously very important for the formation of secondary organic aerosol. We don't discuss the formation of secondary organic aerosol in this document. And of course gas particle partitioning is important for PAHs and nitro PAHs, which are distributed between gas and particle phase. And that's dealt with in the individual appendices dealing with those classes of compounds.

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PANEL MEMBER ATKINSON: So the appendix is -- Sara mentioned the appendix deals with 43 compounds or classes of compounds. The PAHs are one class, nitro PAHs

are in another class. Most of these are directly emitted. Some of are both directly emitted and formed in the atmosphere. Formaldehyde being an excellent example of that. In the L.A. Basin in summertime about 80 percent of the formaldehyde present is due to atmospheric reactions; the other 20 percent due to direct emissions. And a few, primarily PAN, peroxyacetyl nitrate, is formed only as an atmospheric reaction product. It's not emitted.

And we only deal with the first generation products of the compounds looked at. Obviously those first generation products can continue on to react. And it gets to be -- if we were to attempt to follow that through, it would get to be extremely complex and a fairly horrendous thing for anybody to read. So we stop at first generation products. But what we find, for example, is some of the first generation products of chemical X are dealt with somewhere else in the appendix as either an emission or as potentially a secondary product.

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PANEL MEMBER ATKINSON: And I'm going to walk you through one example. There are 43 of these things, and I'm not about to try and go through them in any detail. But in a brief sort of way, I've taken this example, 2,3-dimethylbutane emitted in vehicle exhaust. Presumably it's also an evaporative emission.

So we went through the atmospheric chemistry, what happens to this thing in the atmosphere. The rate constants for its reactions with OH and NO3 have been measured. No reaction with ozone is expected. Alkanes do not react with ozone. There are no carbon metal bonds. The dominant trop -- and there's no photolysis. They don't absorb in the region above 290 nanometers. And a dominant loss process a reaction with OH radicals. And if you use a global tropospheric OH radical concentration, the lifetime's about a couple of days. So it could be transported a reasonable distance.

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PANEL MEMBER ATKINSON: The reaction --

PANEL MEMBER GLANTZ: Then the lifetime is the time constant?

PANEL MEMBER ATKINSON: Oh, if I took a half-life, it's 1.4 days for it to -- half of it to react.

PANEL MEMBER GLANTZ: Okay.

PANEL MEMBER ATKINSON: And that's all defined in the introduction in the overview, the difference between lifetime and half life.

If you look at that molecule, you'll see there are realty -- the OH reaction, I should start off with. The OH reaction proceeds by H-atom abstraction from a CH bond. There's only two types of CH bonding in that: The

primaries, of which there are 12 of them; and the 2 tertiary CHs.

It can be estimated or it is estimated that 88 percent or about 88 percent of the reaction proceeds by H-atom abstraction from the two tertiary CH groups; the rest from the primary CH groups. In all cases, if you use RH equals the dimethylbutane, then there's a series of four reactions: The OH radical abstracts hydrogen; the alkyl radical; immediately adds oxygen -- or very rapidly adds oxygen. Lifetime on the time scale for that reaction's about a microsecond. In the presence of NO typical of an urban area, the organic peroxy radical RO2 reacts with NO by two pathways. One to generate an alkoxy radical, the RO and NO2. The NO2 photolyzes and gives you ozone. And the other pathway is to form an alkyl -- in this case a C8 alkyl nitrate.

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CHAIRPERSON FROINES: Wait. Can I ask you a question about that?

PANEL MEMBER ATKINSON: Yes.

CHAIRPERSON FROINES: In periods when the NO concentrations are low, do you end up getting the peroxide?

PANEL MEMBER ATKINSON: The RO2 radicals in that case start reacting HO2 and RO2. Ambient conditions you'd

need to be below about 30 parts per trillion of NO. Pretty low. But it certainty would -- could occur or does occur downwind situations.

Chemistry gets more complex. But you do form organic hydroperoxides. We do go through that chemistry in the case of ethane, whose lifetime is long enough that it gets into the -- essentially into the remote troposphere.

For the rest of them we pretty well limit -- it's limited to conditions when NO's around. Otherwise things get more complex. And in most cases there are no data on the system in the absence of NO.

CHAIRPERSON FROINES: I just wondered because of the general question of the significance of organic peroxides.

PANEL MEMBER ATKINSON: Yeah, yeah. That's one way to form them, yeah.

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PANEL MEMBER ATKINSON: So in the presence of NO the reaction then leads to these two alkyl nitrates and the two alkoxy radicals, the two things at the bottom.

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PANEL MEMBER ATKINSON: And those can react -- the alkoxy radicals can react on by three pathways. They can react with 02. They can undergo uni-molecular

decomposition, or they can isomerize. And the isomerization proceeds through a six-member transition state.

Not all these processes are feasible for a specific alkoxy radical. The one's shown can only decompose. There isn't a hydrogen on the carbon where the alkoxy always. And it doesn't have a sufficient number of carbons in a row to undergo the isomerization.

So you have to consider all three. And many cases only one or two of those reactions can actually occur.

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PANEL MEMBER ATKINSON: If we work our way through the entire reaction scheme and it's laid out in reasonable detail in each of the appendices, we end up for this particular compound -- and these are molar yields -- with acetone being the major product. So you can -- I mean another way of saying that is that one mole of 2,3-dimethylbutane is predicted to lead to 1.74 moles of acetone, followed by all the other compounds.

Those are what we predict to come out of it.

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PANEL MEMBER ATKINSON: The next one has the only product study for this compound, carried out in 1980. They observed acetone in about 150 percent molar yield.

Reasonably -- not too bad against the estimate of a -- the guesstimate of 174 percent. They saw C6-alkyl nitrate and a propyl nitrate. We predict two C6-alkyl nitrates. We predict two propyl nitrates to be formed. The results are reasonably consistent went the predictions.

So we go through all of these 43 compounds or classes of compounds. In some cases experimental products data are available, pretty well allowing a fairly complete carbon balance to be obtained. There are some cases where there are absolutely no product data or even kinetic data, and everything is by estimation. There are methods available in the literature largely developed at UC Riverside for estimating the initial rate constants and for the reaction mechanisms and product yields.

So most of them it's a mixture of some experimental data, and the blanks being filled in by predictions.

So that's it. When we go through these 43 compounds, it's clearly -- as Sara said, it's clearly a very minor subset of the hundreds of chemicals that are being identified in gasoline vehicle exhaust and of course the thousands of chemicals that are present in the atmosphere from both gasoline and other sources.

PANEL MEMBER GLANTZ: I can understand why you just did the first order. But do you have any sense, you

know, of if you went one more cycle through? Will that change things very much, do you think?

PANEL MEMBER ATKINSON: Well, yes. Those compounds will react on further. Some will degrade down to smaller carbon numbers. Some will not.

I mean the problem is you've essentially got an exponential growth. You've gone from 43 compounds to 300 on the first shot. The next shot will increase it by -- probably not quite that amount, because -- well, a lot of them are redundant. But you get the same compound from many. But, yeah, you would push it up by another order of magnitude.

So in other words for every product -- well, this particular one we got, let's say, half a dozen products. You would then have to follow that by six times as many data sheets to fill out that.

So things get a bit more tricky.

Some of them are dealt with. Not very many of them, but some of them. Formaldehyde, for example, is in the list. Ethanol, which is an atmospheric reaction product or could be, is in the list. But it just gets -- it gets extremely complex as you go along if you follow it all the way down to the end of the chain. I mean but that is done in chemical mechanisms. But it would become a rather major undertaking even for 43 compounds.

CHAIRPERSON FROINES: Can we have the lights back. I think we're done with the slides.

PANEL MEMBER HAMMOND: I think you're a bit modest. There are a lot more than 43 compounds of course, because you have all these PAHs. I mean there are 43 entries, right?

OEHHA RESEARCH SCIENTIST HOOVER: Yes.

PANEL MEMBER ATKINSON: Yes. Essentially two classes -- of the 43, there are 2 classes. The PAHs being one where there's -- I guess there's something of the order of -- probably deal with about 15, I would guess, of the PAHs, because they're mainly gas phase. And the nitro PAHs, where there's again probably a dozen or more.

PANEL MEMBER HAMMOND: You did talk about particle phase P --

PANEL MEMBER ATKINSON: There is some mention of particle phase, but not a lot, because the database is not overly great and it's somewhat -- I wouldn't necessarily use the word "contradictory," but it's a bit difficult to draw firm conclusions from the particle phase.

PANEL MEMBER HAMMOND: Well, first of all, I just really want to commend you on this. This is just -- to me it's overwhelming. It's wonderful that this -- it's really quite impressive. And just thank you very much. I think it's very good. And thank you.

And in the beginning -- in the main text you talk about the alkanes, but you don't talk about the alkanes in the appendix.

PANEL MEMBER ATKINSON: The appendix has a lot of Alkanes in it.

PANEL MEMBER HAMMOND: It has a few specif --

PANEL MEMBER ATKINSON: Yeah, ethane, the dimethyl pentanes, dimethyl butane. There's about seven or eight of them.

PANEL MEMBER HAMMOND: But you said you thought you were only covering a small portion -- it's only a small portion of maybe the identified chemicals. But it's probably a large proportion of the actual mass of the gasoline, right, if you were to take --

PANEL MEMBER ATKINSON: The alkanes account for about 50 percent of gasoline.

PANEL MEMBER HAMMOND: Fifty?

PANEL MEMBER ATKINSON: Yeah. It's about 50 percent -- alkanes, 50 percent; aromatics, 20; alkenes are about 5.

PANEL MEMBER HAMMOND: So I think you've really covered in here a very high percentage of the composition if you did it by mass.

PANEL MEMBER ATKINSON: If you did it -- yeah, maybe, yeah.

PANEL MEMBER HAMMOND: Not by identified compounds.

PANEL MEMBER ATKINSON: Not by identified compounds, right.

PANEL MEMBER HAMMOND: But this is just quite encyclopedic?

PANEL MEMBER ATKINSON: Yeah, we do cover most -- it does cover most of the aromatics that are present, that's true.

PANEL MEMBER HAMMOND: I don't know what we're supposed to do with this. But I just have to say I'm impressed.

CHAIRPERSON FROINES: Well, we're going to come back to you in a second.

And, Melanie or Martha or Sara, one of the three, needs to tell us as a panel what you would like the Panel to do with the -- in terms of our review and approval.

OEHHA DEPUTY DIRECTOR ALEXEEFF: George Alexeeff.

Yeah, I guess we were -- we're asking you to treat it like in terms of a peer review. So, say, if you were just peer reviewing this, provide us any comments or changes; also to -- you know, any -- you know, maybe suggestions for improvements, and any thoughts either now or in the future regarding where we're going with this project, that would be helpful, just so you kind of

know -- now you have a little glimpse of our plan. And so that's what we're hoping for, just -- there's not a requirement to approve it, because it's not an official toxic contaminant document or a specific air toxics document. But since this fits clearly within this jurisdiction of I think your Panel, I think your Panel is best qualified to look at this type of information.

CHAIRPERSON FROINES: So what I would propose then to the Panel is that since we don't need a vote on approval, we probably won't have any trouble getting a consensus on its quality, that I would then propose, Joe and Kathy and Stan, that we -- as a result of this presentation we send a letter to Joan Denton as Director of OEHHA saying that we've reviewed the document, that we formed the following view of it and therefore we -- we say whatever we think should happen as a result of this process.

And I'm willing to write that document. And Kathy is the lead, so I would send the draft to her, and then we would probably -- since this would be informal, I don't think we could -- I think we could agree by E-mail and send the letter out without bringing it back to another meeting.

PANEL MEMBER LANDOLPH: So you want us just to send our comments to you to compile them, any comments we

have?

CHAIRPERSON FROINES: Well, you -- no, I think -- no, I think right now we want comments for the record now. But what I'm saying is in terms of, quote, findings, that we would do it in the form of a letter to Joan, and that we would circulate the draft letter to the Panel by E-mail and then send it off to Joan when it's complete.

So is that, Stan, okay with you?

PANEL MEMBER GLANTZ: Um-hmm.

PANEL MEMBER LANDOLPH: That's fine.

CHAIRPERSON FROINES: Kathy?

So that at this point what we basically need is comments from the Panel.

And Kathy and I were the leads. So why don't I turn back to Kathy and put her on the hot spot, since she's already given this glowing comment, if you had any other points to make.

PANEL MEMBER HAMMOND: In terms of -- as a -- I wasn't sure what criteria I was supposed to use and what the context of all this was. But, as I say, I'm really glad I'm going to be tested on this afterwards.

CHAIRPERSON FROINES: On the what?

PANEL MEMBER HAMMOND: I wasn't going to be tested on the contents afterwards.

You know, this is really -- it's really quite

impressive.

I don't know that anything's been compiled like this, and this is -- it's great. I'm sure, you know, one could sit there and, you know, pick at this and that. But I think it's really great.

I don't know if this -- I was personally curious about -- the outcomes were based on predictions you made that were based on models that you've been developing, is that it, the combustion products?

PANEL MEMBER ATKINSON: Well, yeah, they're based upon -- I wouldn't call them models as such, but on predictive schemes being developed from lab-based data.

PANEL MEMBER HAMMOND: Right. And that's all published elsewhere in reference to yourself?

PANEL MEMBER ATKINSON: Oh, yeah. It's all in the peer-reviewed literature.

PANEL MEMBER HAMMOND: Right. So given all that's here -- I mean one part of me would like to see that. But then the other part of me says that this is already pretty large. So --

CHAIRPERSON FROINES: But most of it --

PANEL MEMBER HAMMOND: But maybe a little bit of talking about the underlying basis of it, you know.

PANEL MEMBER ATKINSON: Well, the underlying basis -- I mean, true, the underlying basis is really the

discussion in the overview of the reactions -- the reaction mechanisms. So that's really the underpinnings of it.

PANEL MEMBER HAMMOND: Okay. Yeah.

PANEL MEMBER ATKINSON: And --

PANEL MEMBER HAMMOND: So basically that was --

PANEL MEMBER ATKINSON: -- the estimation methods that are used are predicted methods based upon just the database available.

PANEL MEMBER HAMMOND: It's the percentages that blew me away when you were doing the talk here. How you could say 174 percent would go to acetone, I mean it's like --

PANEL MEMBER ATKINSON: Yeah. Well, most of the -- so that just means that most of the compound ends up as acetone -- molecules of acetone.

PANEL MEMBER HAMMOND: Right. Well, no -- I mean a hundred seventy -- you get a hundred -- 1.7 times as many acetone molecules every model you can put in, right.

PANEL MEMBER HAMMOND: Yeah, you just break it up into two almost.

PANEL MEMBER HAMMOND: But I mean I just was surprised. I don't know how you got that.

PANEL MEMBER ATKINSON: Oh, well, yeah.

(Laughter.)

PANEL MEMBER ATKINSON: It gets into the gory details, yes.

PANEL MEMBER HAMMOND: Well, yeah, probably it's not worth it --

PANEL MEMBER ATKINSON: I mean actually you do bring up a point. I mean one way of seeing to that would be to go through one example in an appendix.

PANEL MEMBER HAMMOND: Maybe in the -- I don't know how -- would that be 500 more pages or would that be --

PANEL MEMBER ATKINSON: No, I mean one fairly simple example could be run all the way through with the numbers.

PANEL MEMBER HAMMOND: It might be nice just so people know, you know, the underlying basis. Because otherwise it is kind of a -- you know, it'd just be nice to see --

CHAIRPERSON FROINES: Kathy, what are you saying? You're saying going through the whole process

PANEL MEMBER HAMMOND: Yeah, for one compound.

CHAIRPERSON FROINES: So that what happens with cinnamaldehyde after --

PANEL MEMBER HAMMOND: No, no, not all the steps. Taking one chemical; and as you look at all the results we have here, but showing how did we get to that. You know,

just so people understand the --

PANEL MEMBER ATKINSON: Yeah, it's going a little more detail --

PANEL MEMBER HAMMOND: -- Process by which people go. Again, it wouldn't be all the calculations and all of that, but just showing enough where people can --

PANEL MEMBER ATKINSON: Okay. We can try that.

PANEL MEMBER HAMMOND: I mean that's at least -- that's my own -- I don't know whether that's getting too picky for what this purpose is of the document. That's where I'm not so sure. And a lot of it just has to do with my own wanting to know. But I do think it's -- as I say, I was quite impressed.

Do you need more comments from me at this point? It's not very explicit.

CHAIRPERSON FROINES: No, we're fine. We will -- I'm not concerned.

PANEL MEMBER GLANTZ: I mean one thing I -- I mean this is not my area of expertise either. But I don't quite understand what you're going to use this for though, other than having this inventory basically. I mean how will that then be used?

OEHHA RESEARCH SCIENTIST HOOVER: Well, like I briefly mentioned, basically I'm tabulating all the chemicals that we can actually identify associated with

gasoline. So part of it comes from ARB, this information on what they called profiles, where they speciate these different profiles. And then they told us how to use their codes basically to pull out the gasoline-related profiles and have all the speciated chemicals. So that's within Appendix 2 basically. And then to add to that the secondary products.

So we're trying to look -- we started off the project, we were interested in how do we look at gasoline. So one of the things we considered was looking at mixtures, for example, and trying to look at mixture toxicology. But, you know, the basic fact is that there's just not enough information at this point to go that route. So we went the same old inadequate route of looking chemical by chemical.

So the idea is to try to tabulate as many chemicals relevant to inhalation exposure of gasoline-related pollutants. And then do a big survey of the toxicology of these chemicals. And then, you know, a very small subset actually has data. And then we'll look at what has monitoring data, which is an even smaller subset of that. And then we'll proceed through with those chemicals to a risk characterization.

But actually even just the hazard identification part is very interesting just to see what data are

available and how much of a knowledge gap there is. So that's part of what this is about, just to demonstrate how little is known.

PANEL MEMBER GLANTZ: It looks like a lot was known. There seemed to be a lot that was known.

So would this ultimately have some role as gasoline formulations are changed?

OEHHA RESEARCH SCIENTIST HOOVER: That's sort of the idea, yeah. That's partly why we looked at RFG2, is that was the idea, to have a baseline and look at, okay, here's the baseline. Now, what happens when we change? So actually we're already proceeding on and looking at, for example, the list of chemicals we generate based on 2004 profiles. So then that's the change in gasoline.

So, yeah, it's to look at what happens. And that's the idea.

PANEL MEMBER HAMMOND: For something like that, it might be worthwhile, if you're able to predict some of what's emitted, to come up with a summation through a gallon of gas. I mean you're going to have acetone created by many different routes. So how much acetone comes -- is that -- but I don't know if that's adding too much to the -- but thinking what you just said, I'm thinking -- do you follow what I'm saying? If you could say --

OEHHA RESEARCH SCIENTIST HOOVER: Yeah.

-- given all these different routes, we've got all this acetone formed, here's an estimate for a gallon of gasoline. Because if you were going to reformulate and if you can run this through your magic machines that make this -- which I know are not that simple -- then you could predict what the change in the emissions of acetone would be as a result of a certain reformulation.

PANEL MEMBER ATKINSON: Yeah, that's correct, if you -- you would need the acetone yield from every single compound.

PANEL MEMBER HAMMOND: Well, do you feel that your close -- I mean, again, in terms of the percentage of the mass that's in a gallon of gas, I mean you close enough to be able to at least get close -- you know, have a reasonable estimate?

PANEL MEMBER ATKINSON: Yeah. I mean actually if you are interested in just acetone, you could look at the structure. It would be fairly easy to pull out --

PANEL MEMBER HAMMOND: Well, I just pulled that out of the air.

PANEL MEMBER ATKINSON: -- exactly which compounds would lead to that. But, yeah, it could be -- it can certainly be done. It would require -- you'd have to pretty well be careful about looking at things. So

it's possible for some compounds that the major source could be a fairly minor compound.

PANEL MEMBER HAMMOND: I guess what I'm thinking about is that, again, if it's to be used for things like -- I'm thinking about reformulated gasoline, you might want to be able to say, "Well, how much are you going to switch?" at least for things we might be most concerned about. Guessing.

OEHHA RESEARCH SCIENTIST HOOVER: I would say one of the things we could add based on your comment earlier is to say how much of the mass that is covered by that. So I can pull that out and add it.

OEHHA DEPUTY DIRECTOR ALEXEEFF: Also, sort of a -- hopefully a related comment. One of the issues that came up with ethanol was formaldehyde formation from that. So that definitely fits in with your -- one of the concerns when we were doing the ethanol report is how much formaldehyde is likely to be produced? Because that was the bigger issue.

PANEL MEMBER HAMMOND: And in a sense back -- harking back to earlier this morning, how much is going to be produced compared to how much was produced from other things that are already there that are being produced? So if you're increasing the amount of by .01 percent, you have a different sense of it.

CHAIRPERSON FROINES: What I don't understand -- because this ethanol report is really interesting. You have production of formaldehyde from a number of different sources. You certainly have a lot of acetaldehyde produced from ethanol. You have -- from ethane you have acetaldehyde and ethanol, and so on and so forth.

Based on this and the report that we don't remember seeing, we are all about to be breathing gasoline that comes from a lot of ethanol being added to it in place of MTBE. And are you in the process of looking at that as an important issue?

OEHHA DEPUTY DIRECTOR ALEXEEFF: Well, you know, we looked at it a few years ago, and we didn't see a substantial increase in risk, because there was some decrease in risk and some increase in risk. I think it was primarily from -- well, we look at it both from chronic respiratory effects as well as cancer. Andy might be able to answer that since he actually wrote the report. But what -- I think it was Martha that indicated what we're trying to establish here is the baseline for this particular fuel, so we get a sense as to what kinds of products are produced so we'll have a better understanding -- as they reformulate in the future for some purpose, we'll know if maybe some other chemical might be produced at a much greater extent.

CHAIRPERSON FROINES: Well, I understand that. And we'll come back to that when I get to make comments.

But ethanol is MTBE all over again. So that -- and --

PANEL MEMBER GLANTZ: What do you mean?

CHAIRPERSON FROINES: It's an additive to gasoline. And that MTBE is no longer an additive to gasoline because of the controversy that erupted as a result of it. And everybody -- you know, Al Gore campaigns in Iowa in 2000 to use ethanol in gasoline. And every Senator in Congress seems to be pushing for ethanol. And so we have an enormous political inclination towards the use of ethanol.

And there are then people like me who say, "Hold on. We've been through MTBE. What about the products that result from ethanol," including PAN, including acetaldehyde, including formaldehyde? We've got some bad actors. Trouble with PAN is we don't know enough about how bad of an actor it is. And that may -- PAN is one of the gaps that I think really is a problem from a toxicologic standpoint. And so the question is: Are we -- is ethanol MTBE?

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: This is Andy Salmon with the Office of Environmental Health Hazard Assessment.

I can just very briefly describe the conclusions of our report. This was the report which George was referring to, which was produced in response to the Governor's Executive Order.

What we basically did in that report was that the Air Resources Board ran a series of air shed models for South Coast District based on the expected emissions inventory given the comparison of either what was then the standard gasoline, which contained MTBE, or a projected equivalent gasoline, which was hydrocarbon only. It didn't contain either MTBE or ethanol or the proposed ethanol-containing gasoline which would replace the MTBE gasoline. And we basically looked at the projected levels of different products that we knew about, concentrating on the compounds which we saw as being different based on the Air Board's model.

Now, I'm not saying that we had as comprehensive a coverage of all the possible products, as certainly as we're seeing this report now. But the major ones were identified.

The overall conclusions was that the actual changes in gasoline composition didn't make a very large difference. Obviously, you know, some are more exotic products and not anywhere associated with the ethanol or the MTBE or the alkanes. You know, the assumption was

that the aromatic content, for instance, would be similar in any case.

The things where we did see a change was -- we saw very little change indeed in formaldehyde. And the main reason for that is -- Dr. Atkinson will I'm sure correct me here. But my understanding is that well in excess of 70 percent of the formaldehyde is a secondary product and was, therefore, in effect, similar across all formulations.

There's a little bit --

CHAIRPERSON FROINES: Across all four what?

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: I'm sorry?

CHAIRPERSON FROINES: I didn't get that last word.

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: The --

CHAIRPERSON FROINES: Similar across all four --

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: -- all formulations.

CHAIRPERSON FROINES: Oh, formulations.

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: For three formulations.

And the one which, as you would probably expect, did show a modest increase was a little bit more

acetaldehyde in the ethanol case. And there are one or two products which were very slightly increased as a result of the MTBE.

But, in fact, the important lesson was that the oxygenate additives did not make a big difference in the spectrum of air pollutants that were being produced. There were some minor decreases in some components and minor increases in others. But overall there were not large changes.

I think what the -- the overall conclusion of the report was that the concern with MTBE primarily was the adverse impact on groundwater. And of course our report and the Air Resources Board report was also coupled with a report which came out subsequently, because it took a lot longer to produce, which the Water Resources Control Board commissioned. And a lot of that was done by Lawrence Livermore Laboratory and their various people. And that was looking at the groundwater impacts. And the overall grand conclusion was that the air pollution impacts were not very large, but obviously the major concern between the three alternatives was that MTBE because it's persistent in the groundwater was a much bigger problem than either of the other two options.

CHAIRPERSON FROINES: Well, since I wrote the health effect section of the MTBE -- of an MTBE report,

I'm happy to not talk about MTBE, believe me.

But I am curious about this issue of acetaldehyde and formaldehyde from ethanol, which I think is -- I think there's a certain amount of glibness going on with respect to that particular issue at this point.

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: Well, based on the model --

CHAIRPERSON FROINES: And we're about to start doing a study in Columbia, Latin America, on measuring those kinds of things in the atmosphere.

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: Yes, which -- one of the things which the ethanol report did note was that the proposed ethanol gasoline that we were looking at was a relatively low rate of incorporation of ethanol. And certainly it -- I mean there are real data based on the experience I think particularly in Brazil, with the much higher levels of incorporation of ethanol, where the amounts of additional acetaldehyde in particular were very large. But the particular scenarios which were looked at in the report which we did didn't result in a particularly substantial increase than in -- we were still in the ethanol content range where the majority of both aldehydes were in fact being derived by secondary reaction from the alkanes and things like that.

PANEL MEMBER ATKINSON: Yeah. And those were with vehicles with catalysts.

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: Exactly. This was with -- this was the project --

PANEL MEMBER ATKINSON: Whereas I assume the Brazil study was originally many years ago with -- so, yeah, I mean I've seen those data for -- they were used on a national academy study of the effects of MTBE and ethanol on urban ozone. But also it did have data in on various toxics. And, yeah, there's a modest increase on the California data and some industry data on -- modest increase in acetaldehyde.

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: But formaldehyde is very --

PANEL MEMBER ATKINSON: It's not -- the relationship goes up by maybe 50 percent in the emissions.

PANEL MEMBER HAMMOND: Were those increases because of the combustion products of MTBE or ethanol, or were they -- the presence of those led to different chemical reactions to the other components?

PANEL MEMBER ATKINSON: Probably the combustion products of ethanol and MTBE.

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: It's primarily the emissions, because --

you know, California vehicles are relatively well controlled as far as passive -- you know, evaporative emissions. And there's a lot of control over how the materials handled. So the inventory that you see in the models we looked at is primarily the result of, you know, the -- and, as I say, the acetaldehyde with the California formulation, California vehicle is modestly increased. Almost no change in formaldehyde because so much of that is secondary anyway.

OEHHA CANCER TOXICOLOGY AND EPIDEMIOLOGY SECTION SUPERVISOR SANDY: Martha Sandy with OEHHA.

To get to your question, Dr. Hammond. Our plan for this series of reports is to use the air monitoring data from ARB to look at and compare the emissions -- you know, what's monitored and what the gasoline attributable portion of these different emissions are from the 1998 to 2000 period, and then later on once most of the fuel did contain ethanol to see if the models predictions hold true in the real world.

PANEL MEMBER HAMMOND: That'd be very interesting.

CHAIRPERSON FROINES: Stan, do you have any comments?

PANEL MEMBER GLANTZ: Well, I don't have any substantive comments about this because I'm not a chemist.

But I was impressed by it.

The one health point that I would make, when you get down the road and start using this stuff for health risks assessments, I hope you won't just look at cancer, because several of these things, like 1,3-butadiene and some of the PAHs are atherogenic and are -- you know, increased heart disease too. And a lot of the, you know, work looking at air pollution and heart disease as we're looking at particulates, which are certainly -- probably the most important thing are probably the particulates. But some of these other compounds also have important effects and they probably affect other -- some of them are very strong oxidants and affect oxidant loads and lipid metabolism and things like that. So I think -- you know, that's probably a ways off.

But I think some of these things could -- that that should go into the model. And it may well be more important than the cancer effects.

OEHHA RESEARCH SCIENTIST HOOVER: Yeah. So actually as part of the hazard ID we're going to provide sort of preliminary screening data of that sort, like identifying a whole bunch of different health effects. And then we're going to focus in on a couple to start with in terms of actually characterizing risk. But, yeah, that's -- the future idea is to go beyond cancer and

respiratory toxicity.

PANEL MEMBER GLANTZ: Yeah, I mean there are direct experiments with -- animal experiments with 1,3-butadiene where they expose -- I can't remember which animal it was, but they would expose them to varying levels of 1,3-butadiene, and they got a dose response increase on atherosclerosis pretty quickly, and within a few weeks.

CHAIRPERSON FROINES: Well, can I comment on -- are you -- I don't want to cut you off.

PANEL MEMBER GLANTZ: And that was basically all I had to say. And I guess -- well, one other thing, and maybe this was just reflecting my own ignorance, was the -- you know, it wasn't totally clear to me if you were talking about gasoline combustion point of view or -- gasoline combustion products or gasoline evaporation. And --

OEHHA RESEARCH SCIENTIST HOOVER: So clarify that?

PANEL MEMBER GLANTZ: Yeah, that -- that can be clarified. And then I guess the one other thing I'd thought of that -- and this gets back to a comment Kathy made -- is I was sort of hoping for some pie chart that said, you know, for a gallon of gasoline here's what ends up in the air, you know; which is probably more than you

could reasonably expect. But at least if you could get some of the bigger pieces of the pie, that would have at least been interesting to me. And I think if you're going to be getting into your -- actually into some kind of quantitative risk assessment, you're going to need at least a first pass at that. But that was -- I was totally intimidated by it.

(Laughter.)

PANEL MEMBER GLANTZ: There wasn't a single P value that I could find.

(Laughter.)

CHAIRPERSON FROINES: I want to follow -- I want to give --

PANEL MEMBER GLANTZ: Or any of the cohort studies even.

CHAIRPERSON FROINES: I want to give Craig and Joe a chance to comment.

George, don't run away. I think you may find -- or Melanie, I don't -- doesn't matter to me.

OEHHA SUPERVISING TOXICOLOGIST MARTY: We're interchangeable?

(Laughter.)

CHAIRPERSON FROINES: I want to follow up on Stan's comment because I think it's highly relevant. And, that is, that I had a debate yesterday with Bart Croes at

ARB on this issue that we're talking about here. And I asked him what his interest in vapors was as a co-pollutant to particles. And he basically said that ARB was not -- thought that the impact of some of these compounds that we're talking about here today was relatively negligible, and therefore wasn't sure of its importance. And I pointed out the fact that in southern California, 95 to 99 percent of the PAHs is naphthalene, which is -- Roger got 99 percent in his Glendora study years ago, and .018 percent was BaP, benzoatepyrine. So if you have 99 percent versus .02 percent, there is a difference. And --

PANEL MEMBER HAMMOND: What's P value?

PANEL MEMBER ATKINSON: That's gas phase PAH versus particle phase --

CHAIRPERSON FROINES: Yeah, versus particle phase BaP.

And the point I'm making is that -- is that the PAH that dominates southern California at least is naphthalene and the second highest is phenanthrene. Now, the point I want to make is that those are both in the vapor phase and those both undergo atmospheric chemistry that we've seen to form highly toxic quinones. And that how much is a question that we're all still debating and working on. But the quinone stand that are formed are

going to result in the formation of reactive oxygen species internally, they're going to result in the production of oxidative stress, they're going to produce oxidized cholesterol, they're going to end up producing atherosclerosis or at least the enhancement of atherosclerosis, and that they actually are very important.

Because in part what Bart was arguing -- and this is the point that I think is most important -- is when you look at things like the PM2.5 epidemiology, and you look at Arden Pope's work, what Arden Pope's work shows is the cardiovascular effects far outweigh the cancer in terms of significance. And so you can say, "Well, there's a bunch of these vapors that are carcinogenic, but they don't really count for much relative to the atherosclerosis."

But my point yesterday with Bart was that these vapors are very likely to be active toxicologic agents with respect to atherosclerosis. And so if you don't take 99 percent of the naphthalene into consideration -- he says that the unit risk value for the cancer associated with naphthalene is so low that it doesn't account for much cancer. But that's --

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: That's not true.

CHAIRPERSON FROINES: I know that. I know that.

I wasn't going to get into that argument. But I'm arguing atherosclerosis, Andy.

(Laughter.)

OEHHA SUPERVISING TOXICOLOGIST MARTY: I think OEHHA would have a different reply.

CHAIRPERSON FROINES: I know what you're going to say. But -- I know what you're going to say.

What I'm saying is that there are other -- you are absolutely right, there are other toxicologic endpoints that are really important that these vapors may contribute to, and we need to put a lot of attention to that issue.

PANEL MEMBER GLANTZ: Yeah, the -- and I can't remember if it's acetaldehyde or acrolein. But one of those has a very long half-life in blood. And it's a hugely potent oxidizing agent. And in addition to the atherosclerotic effects we were talking about before, there's some evidence that, you know, this cause is related to acute responses to inflammation, platelet activation -- all that stuff in the ETS report, the altered vascular property stuff that you talked about in there, seems to be tied up with -- I can't remember which of them it is.

You know, and the other thing, if you go back to the ETS report, the attributable deaths for heart disease

are an order of magnitude bigger than cancer. And it's not nicotine that's doing it. It's all that other combustion stuff. And the -- you know, it's an interesting question, because everybody -- you know, for years when you talked about air pollution and heart disease, it was like, oh, that's silly. But now people have realized it's not so silly. But most -- as John said, most of the attention has been on the particulates. And I mean they're definitely -- that's definitely a big issue.

But I think these other things are very, very important. And I think that in addition to the sort of longer term atherosclerotic effects, probably some of these things are also mediating through acute changes in platelet function, nitric oxide, all that kind of stuff too.

And I'll bet you when the dust settles or the -- whatever gases settle, whatever, that those effects are going to be bigger than the cancer effects, at least some of them.

CHAIRPERSON FROINES: Well, I know Andy wants to jump in here. But I want to -- I just want to say one thing. We can show that these naphthalene derivatives inhibit irreversibly an enzyme called PT1B, which then sets in motion a whole downstream process affecting signal

transduction and that you end up with very clear enhancement of asthma from, again, naphthalene derivatives.

And so that we have the potential for inflammatory processes and oxidative stress. In terms of atherosclerosis, we have asthma enhancement. So that I think one of the things that should go into my letter is that these compounds are -- have potentially important endpoints that need further investigation.

And I -- you're more than welcome to tell me that the cancer risk assessment on naphthalene is worse than what I said. But, remember, you're picking on Bart now, not me. And I don't know whether it's entirely fair -- well, I don't want to pick on -- I mean I just used that as an example. I didn't want to create an interagency --

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: Andy Salmon again here.

I wasn't actually going to say that at all. What I was going to say was I wanted to slightly reemphasize what I was saying about the ethanol report as a whole. It certainly wasn't the case that the various observed vapor phase components didn't have important impacts. We didn't know as much about the naphthalene side when that report was written in 2000 as we do now. But, you know, though certainly we didn't discount the impact of those

fractions. We merely said that it was going to be the same regardless of which formulation we looked at. And the same is substantially true for the aldehydes.

But certainly in the aldehyde cases and other -- you know, the respiratory irritant endpoint group which we selected, which included acrolein, acetaldehyde, formaldehyde, we were predicting as an index of well above -- well, you know -- of well above 1 just in ordinary ambient background conditions for aldehydes as respiratory irritants.

And also the other thing, which we were somewhat concerned about because it's something which is potentially increased with ethanol, is the peroxyacetyl nitrate side of things. So, you know, the eye irritants, the PAN and the various other congeners, as it were, in that series.

So there were some very substantial health impacts predicted for any of the three formulations we looked at. It's just that they weren't very substantially different between the three cases. That was the point I wanted to make.

But I'll shut up about naphthalene also.

PANEL MEMBER GLANTZ: You know, the one other thing --

CHAIRPERSON FROINES: No, it's fine.

PANEL MEMBER GLANTZ: -- that it seems to be clear though is some of these things which are currently viewed as respiratory irritants are actually having cardiovascular effects too, because they trigger the inflammatory process which is triggered in the lungs, releases things like CRP and things like that, which then have other effects. So I think -- and these are things that are just being figured out now. But I think there are things you ought to -- I mean to put into the equation as you move forward, after Roger gets the pie all divided up on the chemicals.

CHAIRPERSON FROINES: I wanted to give -- I have some comments, but I wanted to give Craig and Joe a chance --

PANEL MEMBER BYUS: I think it's an outstanding job, typical of much of the work that's done at the University of California Riverside, I might say.

(Laughter.)

PANEL MEMBER BYUS: Another example of outstanding science coming from our institution.

(Laughter.)

PANEL MEMBER BYUS: And probably Janet did most of the work actually.

CHAIRPERSON FROINES: I think that --

PANEL MEMBER ATKINSON: Careful there.

(Laughter.)

CHAIRPERSON FROINES: Come on, Joe, bring out the negatives. Because between Kathy and Craig, we've got flowers being strewn around the room.

PANEL MEMBER LANDOLPH: No, I do think it's a great report. I didn't have anything negative to say. It's a lot of work. It's a huge amount of work. And it's very well done, it's very well written up.

And I had a couple of questions which are more of a scientific interest than it being negative or anything.

One was your statement the experimental data indicate that the gas phase PAH don't photolyze under atmospheric conditions. Why is that? Is the wavelength of light getting through too short to hit the excitation spectrum?

PANEL MEMBER ATKINSON: They undoubtedly -- they do absorb radiation, but they just don't photo decompose. So it gets internally converted.

PANEL MEMBER LANDOLPH: They just --

PANEL MEMBER ATKINSON: They don't photolyze. I mean there's no evidence for the gas phase PAH photolyzing. There is evidence for particle phase.

PANEL MEMBER LANDOLPH: Do you get fluorescence or intersystem cross phosphorescence or --

PANEL MEMBER ATKINSON: It's got to be into

intersystem cross --

PANEL MEMBER LANDOLPH: And what about the -- I guess you would call stuff like benzoatepyrine, that would be more of a particulate phase, so you may --

PANEL MEMBER ATKINSON: Right. There is evidence for photolysis of those. But it depends what type of particle it's on, whether it's a -- I mean a sub-particle versus fly ash versus whatever. So it's very difficult to come up with any atmospherically relevant numbers.

PANEL MEMBER LANDOLPH: And I'm going to guess with benzoatepyrene you probably get one electron-induced quinone formation?

PANEL MEMBER ATKINSON: I don't know. The major loss process for BaP in the atmosphere appears to be an ozone reaction on the particles. That's -- at least you can rationalize it that way, with a lifetime of a few hours.

PANEL MEMBER LANDOLPH: And what products do you see from ozone adduction?

PANEL MEMBER ATKINSON: Offhand I couldn't tell you.

CHAIRPERSON FROINES: I bet it's going to be a quinone.

PANEL MEMBER ATKINSON: It might be. But people have never reported it.

PANEL MEMBER LANDOLPH: And also you see a hydroxyl radical reacting with benzoatepyrine to give you hydroxyl benzoatepyrine?

PANEL MEMBER ATKINSON: There's no evidence on atmospherically relevant particles. People have seen it on -- oh, on the laboratory-generated particles. But that's -- they're not the same. So it's very difficult to go from -- to look at particle reactions and say that they're relevant to the atmosphere.

PANEL MEMBER LANDOLPH: And I was looking at your xylene on page A-189, which is interesting.

So a lot of those reactions that occur on xylene you can't extrapolate with big molecules like benzoatepy --

PANEL MEMBER ATKINSON: You could extrapolate them to naphthalene, but you can't extrapolate them to -- not to the particle associated.

PANEL MEMBER LANDOLPH: That's very interesting.

PANEL MEMBER ATKINSON: And naturally there are differences between the monocyclic aromatics and the polycyclic aromatics, even in the OH experiment -- Oh systems.

CHAIRPERSON FROINES: You know, one thing that's interesting. Roger McClellan in 1983 did a paper on putting BaP on carbon black. And what was interesting was

that they got about 20 percent yield of quinones in the animal when they looked in their lungs. And what was interesting is they did not find any products of the diol epoxide or the radical cation. In other words, it appeared that -- every toxicology textbook shows you the diol epoxide as the primary pathway.

But in fact the quinones dominated the metabolism. And so that what every little toxicology student learns is, so oversimplified, that it's just -- it's a mistake, because the quinones are really quite dangerous because they can redox cycle catalytically. And so you're generating millions of ROS molecules. Whereas the diol epoxide's an electrophilic attack, and so it's stoichiometric.

As soon as you go through the phenols, it's easy to interoxidize the quinones, that -- process.

Then I had another question for OEHHA themselves. You know, it struck me a lot of effort and resources are going into these risk assessment calculations. Did you ever do one or think of doing one -- which would be an imaginary type of experiment. Suppose all the cars in California were replaced with gas-electric hybrids, the average gas-electric hybrid. How much of the projected cancer incidents would go down in this state? Do you have any feel for that in terms of orders of magnitude? Have

you ever thought about that?

OEHHA SUPERVISING TOXICOLOGIST MARTY: We haven't done any calculations like that. But the whole idea of the hybrid vehicle is to reduce the toxics emissions as well as CO2 emissions, reduce all of the NOx, reduce ozone, you know. So it's sort of an across the board "let's reduce what's out there." Presumably if you assume a linear dose response for most environmental carcinogens at exposures currently experienced, then there should be a reduction by whatever percentage you can push down emissions.

PANEL MEMBER LANDOLPH: So that might be a simple --

OEHHA SUPERVISING TOXICOLOGIST MARTY: That's pretty simplistic. But --

PANEL MEMBER LANDOLPH: No, it's a reasonable place to start. So you might just simply look at how much, say, gasoline's consumption decreased and then go to your -- go lower down on the curve to that new figure. So you might actually already have the data in your office, huh?

OEHHA SUPERVISING TOXICOLOGIST MARTY: Well, not entirely.

OEHHA CANCER TOXICOLOGY AND EPIDEMIOLOGY SECTION SUPERVISOR SANDY: The whole point of the exercise we're

going through in this project is to come up with some way to try to characterize the cancer risks with a baseline gasoline. But we acknowledge up front we'll have many data gaps because we have chemicals that are identified as carcinogens emitted in gasoline combustion processes which -- for which we have no emissions data. So we're going to have gaps. So any attempt to do a cancer risk for California gasoline use is going to have a lot of uncertainties.

OEHHA SUPERVISING TOXICOLOGIST MARTY: To some extent you end up looking under the lamppost because that's where you have the data. But we're trying to get away from that as much as possible.

PANEL MEMBER GLANTZ: It is though a really interesting question though, because I think -- I think that the -- we have a hybrid. And I think that the -- as I recall then reading about it that the emissions drop by more than the mileage improves, because they don't idle. So I mean it would actually be a really interesting exercise to do.

PANEL MEMBER LANDOLPH: Well, the reason I asked that question is it's pretty clear, you know, the standards are getting heightened tightened, and yet still we're having more people come into the state, emissions are going up. So there's a point at which we're going to

be going backwards, no matter how stringent the standards are. If we make the standards too tight, we won't have any more industry left. So clearly we need some kind of technological fix along the way. That certainly is one way out of the box.

CHAIRPERSON FROINES: Can I comment on this, in a sense. Melanie and these folks know what I'm about to say. But the -- we did a study at the Caldecott Tunnel -- you know where the Caldecott is -- and we looked at bore 1 and bore 2. Bore 1 has both kinds of vehicles, that is, diesel and gasoline. Bore 2 -- I may have it backwards. But one of them is only light-duty vehicles and one of them is a mixture. And the -- we had results from 1997 where a similar study had been done. And what we were able to show is that the PM2.5 levels have dramatically decreased since 1997 to 2004. But the number of particles has dramatically increased during that same time period. In other words we are reducing the mass concentration and at the same time we are increasing the number of particles.

Now, if those ultrafine particles that are increasing are more toxic than what you've reduced, then your toxicity will have gone up. So that to do a risk assessment, we're going to have to figure out the level of toxicity of ultrafine particles so we can actually do a

proper risk assessment. And at this point we really can't do that, I think.

And what we found, Stan, is that the -- I sent -- you got the E-mail with the slide. In terms of redox activity, the gasoline ultrafines were twice as toxic as the diesel ultrafines. And so not only is -- so that the toxicologic data that we're generating seems to indicate that, yes, cars put out a lot less than diesel trucks do, but it's not clear what the relative toxicity has to do in terms of -- and that's defined by composition and it's defined by a whole series of the nature of the generation of the ultrafines.

And so I think that gasoline is something that is an extremely high priority at this point. And so that this is like really quite crucial what they've done, because I think that there's a possibility that gasoline -- that we should have declared gasoline a TAC a long time ago, if you want my honest opinion.

And so hopefully this will lead to gasoline coming before this Committee at some point. Because I think it's absurd that we're in 2000 -- almost 2006 and we haven't yet decided what we think about gasoline.

Now, I don't -- so the experimental data that we're collecting seems extremely interesting on the gasoline issue. One has to take it quite seriously, I

think, because we've had such an emphasis on particle toxicology, toxicity.

Joe, were you finished?

PANEL MEMBER LANDOLPH: Yeah, I think the report was terrific. I think you put a lot in to it. It's very rigorously written. It's very informative. I enjoyed reading it.

CHAIRPERSON FROINES: So I -- just a few comments.

This report focuses on atmospheric transformations. And yet obviously when you start to think about gasoline and vapors vis-a-vis regulatory decision making, you want to know what the importance of emissions that are oil based -- you know what I mean? -- I mean crankcase oil -- we need to know what the components of gasoline are relatively speaking, we need to look at PM from vapor condensation, we need to look at secondary organic aerosols, and we need to look at PM within this context. So it seems to me that this is one piece of what looks to be about a five or six piece endeavor. Is that a fair comment?

OEHHA SUPERVISING TOXICOLOGIST MARTY: Yeah, I think if --

CHAIRPERSON FROINES: What I'm trying to --

OEHHA SUPERVISING TOXICOLOGIST MARTY: -- if

we're going to keep moving forward.

CHAIRPERSON FROINES: I want to write something that says what you should do. And so tell me if you think that's right.

OEHHA SUPERVISING TOXICOLOGIST MARTY: Well, I think that's a very valid comment.

CHAIRPERSON FROINES: Then --

OEHHA SUPERVISING TOXICOLOGIST MARTY: That this is just one piece -- a small piece of the pie. There's a lot more work that could be done to develop more information on the public health impacts of gasoline usage essentially.

PANEL MEMBER GLANTZ: What's the next -- I mean in reading this I had the sense that this was the first of a series.

OEHHA SUPERVISING TOXICOLOGIST MARTY: Yeah.

PANEL MEMBER GLANTZ: What are you planning next? What's the sequel?

OEHHA RESEARCH SCIENTIST HOOVER: Well, I say that -- I mean the comments you're making, there's a lot that's planned and there's a lot more that we know that we could do. So the first element is what I was talking about, which is looking at identifying the chemicals, screening for toxicity and then looking at what data do we actually have in California on monitoring data, looking at

population-weighted exposure estimates for those chemicals, and also doing a source apportionment for that exposure so that you can attribute what portion of that can be attributed to gasoline use in California. So that's all planned.

And then the next piece that's planned is to look for available health assessment values that relate to cancer -- so unit risk values -- and chronic respiratory toxicity. And generally speaking we're talking about CRELs in that case. So doing that.

Now, another piece that is envisioned is actually doing more assessment of chemicals that haven't been assessed but actually have data, because that's also true. There's some chemicals in here that don't have values now but could have values. So that's another part that's planned.

An then there's -- you know, it just kind of gets bigger and bigger, because then there's all these other health effects that you could look at as well. So that's --

CHAIRPERSON FROINES: But you're not planning to do -- you said toxicologic screening. You mean --

OEHHA RESEARCH SCIENTIST HOOVER: Not -- literature screening, literature screening.

Yeah, that's another thing that can be done. And

actually that was -- in some of the meetings that we had, you know, there was discussion about some of the work that's being done on lab screening of gasoline-related compounds that's being done.

But, yeah, that's not something that we do at OEHHA.

CHAIRPERSON FROINES: Stan, there's a -- I think -- correct me if I'm wrong. But at the risk of -- well, no. Correct me if I'm wrong, but there are -- some of the work that Roger is talking about derives from chamber studies, and there is not literature on what are in the -- what's in the ambient concentration in, say, southern California, and that that's -- some of that's still -- much of that is still being determined. And so one issue is an ARB issue, which is: To what degree does Lynn Baker and others start looking at some of these airborne concentrations that we haven't measured? And so we really don't know what the size of the problem is. Is that reasonable?

PANEL MEMBER ATKINSON: Yeah. I mean there's a fair number of these products that have not been measured in number. Some haven't been measured in the line either.

CHAIRPERSON FROINES: So this is a big issue I think of -- of all the things that he was predicting, nobody's really looked for them in the air. And so

it's --

PANEL MEMBER HAMMOND: But that's part of what you were saying that they were going to start doing with ARB, right? Just don't have an opportunity to do that.

CHAIRPERSON FROINES: Did she say that?

PANEL MEMBER HAMMOND: Did somebody --

CHAIRPERSON FROINES: I didn't hear that.

OEHHA SUPERVISING TOXICOLOGIST MARTY: Well, it's really up to ARB on, you know, what they have the -- first of all, many of these things probably do not have standard methods for just putting a monitor out there and measuring. And so developing the methodology is a huge issue. They had to do that with acrolein recently, which was difficult to measure. And they had to go out and develop the method. So that's step 1.

And step 2 is, you know, how much money does their monitoring, the labs division have to go out and do those kinds of things, you know. Which is a question I can't answer and probably folks here can't answer either.

Which also --

CHAIRPERSON FROINES: Yeah, I think I -- that was one of my comments, is I think we also have to say that there are important analytical issues that need to be addressed, because that's -- we always talk about going out and measuring things. And obviously the analytical

questions are really quite central, most the -- acrolein being a classic example.

I think ARB now has an acrolein method for monitoring. Is it Judy Charles?

OEHHA SUPERVISING TOXICOLOGIST MARTY: Yes.

CHAIRPERSON FROINES: No?

Your own lab.

Because we supported Judy Charles when she was alive to develop the method.

Now, acrolein clearly needs to be tested in an NTP bioassay too, because it's a Class 3 carcinogen. And it clearly undergoes cycloaddition reaction. So it's a powerful electrophile. And yet it shouldn't be a Class 3 at this point.

OEHHA SUPERVISING TOXICOLOGIST MARTY: Yeah, as I recall that one of the problems with acrolein is it's so irritating that when you give it ventilation, you can only use really low doses.

CHAIRPERSON FROINES: Well, the trouble is the animals shut -- their lungs shut down.

OEHHA SUPERVISING TOXICOLOGIST MARTY: Yeah. So that they've had trouble even trying to test it over long term.

CHAIRPERSON FROINES: Absolutely.

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT

CHIEF SALMON: I was just going to say that with a reactive and highly irritant compound like this, next to impossible to do a long-term study at all with animals. So it's not surprising that the result isn't there.

CHAIRPERSON FROINES: But there has to be -- we need somehow to develop more information on the genotoxicity and carcinogenicity of acrolein, because it can't just stay as a Class 3 carcinogen. That's -- it's just absurd.

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT

CHIEF SALMON: There's some interesting things going on in terms of relatively short-term indicators of biochemical and genetic endpoints that happen, you know, when you do inhalation carcinogens. I mean I know that there's been -- we'll a number of people have been looking at that sort of thing. But, you know, there are a number of things which might be done that would be very interesting, if somebody has the money and the equipment.

CHAIRPERSON FROINES: I also think --

OEHHA SUPERVISING TOXICOLOGIST MARTY: We have most --

CHAIRPERSON FROINES: Oh, sorry.

OEHHA SUPERVISING TOXICOLOGIST MARTY: I'm sorry.

Most airborne concentration estimates of acrolein are above our chronic reference exposure level.

CHAIRPERSON FROINES: Yeah. I think, by the way, one of the things that would useful at some point is to figure out all the compounds that we're talking about that can undergo reactive oxygen species formation and look at them as a group in terms of what can produce oxidative stress collectively. And it seems to me that we need to look at electrophiles as well collectively in terms of potential health effects.

But, anyway, we can write a letter -- we can write a letter that's 70 pages long saying everything that needs to be done on gasoline.

When we write the letter, I'm going to call on you folks for help to make sure that we don't make a 70-page letter; that it's focused on what might be practical.

Sara, were you going to say something?

OEHHA RESEARCH SCIENTIST HOOVER: No. I was just moving forward to listen to you.

CHAIRPERSON FROINES: All right.

OEHHA SUPERVISING TOXICOLOGIST MARTY: Funding is always an issue. Funding for OEHHA to do this work is an issue.

CHAIRPERSON FROINES: Well, Janette said she's going to contribute a few million dollars.

(Laughter.)

CHAIRPERSON FROINES: So thank you. I think this is more than enough. I think we're -- are we okay, I mean -- we're about to close?

PANEL MEMBER GLANTZ: Well, No. I thought -- well, aren't you going to do -- have a brief presentation?

CHAIRPERSON FROINES: Yeah, yeah, yeah. No, but on gasoline?

PANEL MEMBER BLANC: Come on. We're running out of time. We've got to be out of here --

PANEL MEMBER ATKINSON: -- another 15 minutes.

PANEL MEMBER BLANC: -- 15, 20 minutes.

PANEL MEMBER HAMMOND: But she said it's pretty short.

CHAIRPERSON FROINES: She's going to do it in 15 minutes.

OEHHA SUPERVISING TOXICOLOGIST MARTY: We have very similarly named files.

CHAIRPERSON FROINES: So, Andy, we should talk about the naphthalene unit risk value sometime, because you certainly jumped out of your seat.

(Laughter.)

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: Maybe I was overreacting.

(Laughter.)

CHAIRPERSON FROINES: Well, it was a friendly

discussion with Bart. We were trying to figure out priorities. I'm not trying to say it was a big disagreement. I don't want to go on record as -- I'm saying that --

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: I don't want to go on record as disagreeing with him either.

(Laughter.)

CHAIRPERSON FROINES: No, no. It's an issue of what the epidemiology shows in terms of cardiovascular effects, because it so overwhelms everything else.

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: I think -- yeah, I mean I agree with you on that point. It's exactly the cardiovascular points that definitely dominates the --

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: We need to talk after the meeting. There's more to it than just those effects, with regard to Bart's comment on the -- what it really comes down to is there are deaths attributable to PM. It's very clear. You can do the dollar calculations of those deaths. And those dollar calculations far outweigh the cost you controls. And those are the kinds of arguments we have to make in Business, Housing & Transportation, within the administration, or other places where we're saying you

have to put on gigabucks worth of controls. And if we can -- if any kind of information's available for those other effects, that would be great. But I don't -- it doesn't sound like we're there yet.

PANEL MEMBER GLANTZ: Oh, no. There's some of it is.

CHAIRPERSON FROINES: Well, naphthalene is the one that's so important because there's so much out there.

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: And actually --

PANEL MEMBER GLANTZ: Either acetaldehyde or acrolein -- I can't remember which one -- there's a lot about acute cardiovascular effect. Not a lot but --

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: Well, acrolein is one of the things we're looking at under this.

PANEL MEMBER GLANTZ: No, I know.

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: Well, let's --

CHAIRPERSON FROINES: No, it's no problem. I don't -- I wasn't really saying there was a big disagreement. It's realizing, as Stan said, that there are other endpoints. And it's not just looking at the cancer risk unit for naphthalene. You've got to look at the full toxicity.

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: Well, we've really shifted our focus away from cancer, away from other health effects, and really are focusing on PM and mortality rates associated with PM. There has been a shift in thinking in the organization in the last probably two years.

CHAIRPERSON FROINES: But I think frankly that -- I understood that. But I think that when you look at components and what components cause of health effects and you eliminate 99 percent of your PAHs, that's a mistake. That's something that needs to be taken --

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: No, and I agree with that. And I'm going to touch on that a little bit in my presentation.

CHAIRPERSON FROINES: Go ahead. Shoot.

PANEL MEMBER GLANTZ: And I don't want to prolong this. But I think in terms of some of these cardiovascular effects, that the -- if you go look at the ETS report, that section on altered vascular properties, a lot of the things are the same. And there's -- and the American Heart -- and I'm pretty sure it's cited in there. But the American Heart Association about two years ago put out a -- a sort of scientific position paper review was published in circulation on air pollution as a cause of heart disease. And it talked about -- it had a lot of

this stuff in there too. I don't know if you're -- if you can't find it, I'll find it. I think Pope actually may have been the guy who headed the writing committee.

But, you know, these other -- these acute oxidizing agents -- or these oxidizing agents have powerful acute effects. So I just think they ought to be thrown into the mix as well as particulates.

But, anyhow, I've said enough.

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: Well, what I'm going to do is just provide some quick introductory information on SB 25 --

CHAIRPERSON FROINES: Give him your name.

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: Oh, Bob Barham, the Air Resources Board.

-- and then describe a little bit about what we've been doing over the last five or so years with regard to implementation of SB 25.

(Thereupon an overhead presentation was Presented as follows.)

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: SB 25 required us to evaluate ambient air quality standards, monitoring a toxics program --

--o0o--

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: -- in the context of children's health, and make

a determination as to whether or not those programs were adequately protecting public health, but specifically children and infant health.

We've looked at, as I said, air quality standards, we're looking at our monitoring program and we're looking at our toxics program. And what I'm going to do in the next few minutes is just briefly describe to you what we've done in each of those areas.

--o0o--

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: With regard to the air quality standards program, we've reviewed the standard for PM10, PM2.5, ozone, and nitrogen oxide, and found those to be the highest priority. Lead, carbon monoxide, and hydrogen sulfide are pollutants of concern but not as high a priority as the others.

--o0o--

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: This is just a summation of the actions that we've taken with regard to PM over the last few years. The bottom line of all of this is that it was -- it was based on mortality data, Epi studies, hospital admission, cardiopulmonary studies, a wide range of information. And we estimate that in children in ages from 7 to 14 there'll be about 400,000 fewer respiratory symptoms per year

because of the reduction in these standards.

--o0o--

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: Ozone was reviewed and the standard was lowered. And we did this again in conjunction with OEHHA. Ozone was -- ozone is under review again, as I understand it. And in this review we're looking at a standard perhaps as low as .06. Is that right, the submitted information? That's what Bart said.

So, anyway -- so we're currently in the process of looking at ozone.

--o0o--

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: We're in the process of doing it. But I thought we were -- Bart was saying something about a re-review of ozone. Is that not right?

OEHHA SUPERVISING TOXICOLOGIST MARTY: That will occur in the -- down the pike.

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: Oh, Okay. That's not recent.

Okay. And we're also looking -- we're in the process of looking at NO2 now.

--o0o--

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: In terms of our air monitoring activities, we

assessed the network. And some changes were recommended in terms of improving how the network works. Currently there are about a thousand air monitoring devices around the state. But the problem is primarily that those look at ambient background concentrations.

And what we found, particularly with the toxics program, is that more focused work needs to be done in certain areas. We've done some of the work in Barrio Logan, Boyle heights, the locations listed there. But we've also determined that the classic monitoring systems that we use to do these kinds of analyses in these focused hot spot areas is cumbersome, and so there are contracts underway or in place to look at developing monitoring systems that are much more user friendly. They can be put out and determined what the concentrations are of the pollutants that we're concerned about in a much more cost-effective way than we're currently doing it. Hopefully that work will be done in the next year or two.

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ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: Monitoring -- mobile monitoring has also been done in a number of locations. And I mentioned the lower cost monitoring methods.

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ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF

BARHAM: With regard to toxics, there's been a lot done since OEHHA recommended the five TACs for us to evaluate as part of this program.

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ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF

BARHAM: The five are diesel, dioxins, lead, acrolein and PAHs. And I'll just briefly go over what we've been doing with those pollutants over the last several years.

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ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF

BARHAM: A number of air toxic control measures have been adopted. They're listed there. In addition, we've lowered the sulfur content of diesel fuel. And the reason that's important is that it's necessary in order for the controls to work, particularly the diesel particulate filters on the diesel engines.

New diesel standards have been adopted. The main focus of the program initially was to retrofit diesel particulate controls on older diesel and have them installed on the newer diesels as they come into the market.

What we found was that the diesel particulate filters are very difficult to install on a retrofit basis. So what we're really focusing on now is a faster turnover of the newer technologies.

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ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: And this is just a summary of the controls that will be going forward over the next year or two in relation to diesel.

PANEL MEMBER GLANTZ: Is there any -- we were talking about hybrids earlier. I've read that there are now some diesel-electric hybrids --

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: Yeah, I think UPS has a few of them.

PANEL MEMBER GLANTZ: Do those have much promise for helping with this, do you think?

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: Well, they've got to get the costs way down. Those tend to be a lot more expensive because you're -- you're usually looking at a very heavy-duty vehicle hauling around, you know, 20,000 pounds -- 10, 20,000 pounds. And those systems tend to cost more -- much more proportionately than the systems do on the smaller -- like the Prius or the Honda Insight or something.

So it's out there. I don't know in the market how that's all going to shake out.

CHAIRPERSON FROINES: Speaking of this diesel, I'll just -- we should find out in the next month or two on the litigation on diesel, I think.

In which case, if it comes out badly, we start over again, Stan.

(Laughter.)

PANEL MEMBER GLANTZ: With no jokes.

(Laughter.)

PANEL MEMBER GLANTZ: Although we could invite Garson back.

CHAIRPERSON FROINES: Go ahead, Bob.

PANEL MEMBER GLANTZ: I wonder if he would change his mind.

CHAIRPERSON FROINES: Bob, go ahead.

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: This is all a joke.

PANEL MEMBER GLANTZ: It is not. I was just wondering if he would change his mind again. But anyway --

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: With regard to dioxins, we adopted -- or we reviewed the medical incineration rule. We adopted a reg which prohibited the use of outdoor burn barrels basically in 2002. There was some legislation that passed that required us to look at cruise ships, which was adopted in November -- just this past November. And there was an amendment made to that legislation a year or so ago which required us to look at all oceangoing vessels. And that

work will be done in the next year or so.

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ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: We've also had some air quality monitoring work going on, ambient monitoring of dioxins. The data is collected. It's currently being analyzed.

CHAIRPERSON FROINES: When will that be available, do you think?

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: Some of it is out there. But it's like -- as I understand it, it's done by months or something --

OEHHA SUPERVISING TOXICOLOGIST MARTY: I think right now there -- they actually have a couple of years of data that have already gone through their QAQC process. And they're doing the rest of the QAQC now on the third year of data. And once that's all completed, they are going to post it on their web. So it's pretty close actually to being finalized.

CHAIRPERSON FROINES: Go ahead.

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: Lead. We've reviewed the ATCM for non-ferrous metal melting and determined that no further action was needed. And we're not seeing any additional ATCMs on the horizon.

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ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: Acrolein, POMs, PAHs. The needs assessment is under development. Acrolein is a little farther ahead in the process. POMs, we've had an internal discussion about three months ago on our PO -- basically PAH monitoring and the determined that just looking at the particulate phase wasn't good enough. We needed to expand that, to look at particulate and the vapor phase. And so we shut down the particulate phase. We're in the process of looking at contracting out the work to look at both particulate and vapor phase.

So as to where the contract is, I can't tell you offhand, but it's something that is in the works.

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ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: So that just basically summarizes where we're at.

Do you want to --

CHAIRPERSON FROINES: Are we going to get another list of chemicals to add to the list of five at some point?

ARB STATIONARY SOURCE ASSISTANT DIVISION CHIEF BARHAM: That's --

OEHHA SUPERVISING TOXICOLOGIST MARTY: Yeah. I'm going to talk about that right now.

PANEL MEMBER GLANTZ: You're supposed to say,

"I'm glad you asked that."

OEHHA SUPERVISING TOXICOLOGIST MARTY: I'm glad you asked that, Dr. Froines.

(Laughter.)

CHAIRPERSON FROINES: Something I just missed.

(Laughter.)

OEHHA SUPERVISING TOXICOLOGIST MARTY: As you're I'm sure fully aware, ARB's roles are as the risk managers. And they've focused a lot on looking at the control measures.

For OEHHA, we've -- both groups have duties under Senate Bill 25, which was the Children's Environmental Health Protection Act. OEHHA's major roles have involved looking at the epidemiologic and clinical studies of -- clinical chamber studies of the ambient air pollutants and recommending health-based ambient air quality standards to the Board. And Bob just went through measures that the Board has taken on the ambient air quality standards.

We're also involved in the identification of toxic air pollutants which may disproportionately impact kids. And this is the question that Dr. Froines was bringing up. And ARB is involved in the control piece of that.

And then the third big thing is to look at our quantitative risk assessment methods that are used in the

Toxic Air Contaminant Program and in the Hot Spots Program and see whether they're adequate for really considering infants and children as much as data would allow.

Next slide.

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OEHHA SUPERVISING TOXICOLOGIST MARTY: So in both recommending health-based ambient air quality standards and in evaluating the health effects of TACs, the statute actually says OEHHA shall assess exposure patterns of infants and children and whether they're different than adults, special susceptibilities of infants and children to toxic effects of chemicals, effects of co-exposures to other substances with common mechanisms of toxicity, and interaction of multiple air pollutants including criteria air pollutants and toxic air contaminants.

CHAIRPERSON FROINES: Melanie, I have a question about your last one, interaction. You know, there is this absolutely beautiful work by Cory Slechta in New Jersey on interactions, especially in postnatal animals showing Parkinson's development. And it's a long discussion. But can -- that data is so really interesting. But my recollection is that you can't do -- within SB 25 you can't do pesticides?

OEHHA SUPERVISING TOXICOLOGIST MARTY: That's correct.

CHAIRPERSON FROINES: Because the data that she shows would make you leap to include them.

OEHHA SUPERVISING TOXICOLOGIST MARTY: Yes, unfortunately it was restricted to everything but pesticides in their pesticidal use.

CHAIRPERSON FROINES: It's really too bad, because it's -- have you seen her work on Parkinson's Disease?

OEHHA SUPERVISING TOXICOLOGIST MARTY: Yes.

CHAIRPERSON FROINES: Yeah, it's really quite striking. I think it's -- I've heard her speak a couple times, and it's really interesting science.

OEHHA SUPERVISING TOXICOLOGIST MARTY: I can say that we have relatively little data on those last two bullets.

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OEHHA SUPERVISING TOXICOLOGIST MARTY: So Bob just mentioned that there were five TACs identified. And this Panel was the review panel for the process.

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OEHHA SUPERVISING TOXICOLOGIST MARTY: The requirements of SB 25 pertaining to us are to actually evaluate 15 TACs per year -- these are already identified TACs -- and provide health values protective of infants

and children.

We don't have the funding level that we need to do that. But we are proceeding on. So we are behind actually by about a year and a half in this process.

But this requirement triggered us to look at our risk assessment methodologies and say: Are we really doing what we can do? Are we really considering all of the differences in exposure and susceptibility to toxicants?

Then based on the evaluations of these TACs and after review by this Panel, we will update the list of TACs that disproportionately impact kids. So that is something that's coming down the line.

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OEHHA SUPERVISING TOXICOLOGIST MARTY: In --

CHAIRPERSON FROINES: I don't understand. You said you don't have the funds to do it, but they are coming down the line?

OEHHA SUPERVISING TOXICOLOGIST MARTY: Yeah.

CHAIRPERSON FROINES: Well, how -- can you resolve that apparent contradiction?

OEHHA SUPERVISING TOXICOLOGIST MARTY: Well, we -- in the budget cuts of --

PANEL MEMBER GLANTZ: The check is in the mail.

OEHHA SUPERVISING TOXICOLOGIST MARTY: Yeah, the

check's in the mail.

No, we lost most of the funding related to children's health in -- what budget year that was? -- '02-'03, I think it was. But we're continuing to do the work with the staff that we have. It's just going a lot more slowly than we would like. That is one of the reasons.

CHAIRPERSON FROINES: Well, strategically in some ways to keep doing the work without the money means that somebody is going to say that you can do the work without the money. And so that you -- that may be something you need to think about, how to -- so you don't end up getting -- losing as a result of working beyond, you know, your means.

Do You know what I'm saying?

OEHHA SUPERVISING TOXICOLOGIST MARTY: Yes, I know exactly what you're saying.

CHAIRPERSON FROINES: It would be better almost to not do it and have somebody in the Legislature say you have to do it.

OEHHA SUPERVISING TOXICOLOGIST MARTY: Yeah, we -- our management briefs the Legislature on where we are on things. And one of the questions that has come up is: "How come you haven't done these 15 TACs per year? Why are you guys so behind?" So --

CHAIRPERSON FROINES: Well, this is so -- it's so important, that it's just really tragic that somebody in the Legislature hasn't seen fit to --

OEHHA SUPERVISING TOXICOLOGIST MARTY: -- give us more money.

PANEL MEMBER LANDOLPH: It's the same as running a lab. I mean they say, "Can you do this?" And we say, "Give us more dollars. Otherwise go away."

CHAIRPERSON FROINES: Anyway, go ahead. I'm Sorry.

OEHHA SUPERVISING TOXICOLOGIST MARTY: So because we're trying to reevaluate these TACs, we wanted to make sure that our risk assessments under all the air programs are child protective. So we are reevaluating our methods used to derive reference exposure levels for the noncancer endpoints. In particular, we're looking at that inter-individual variability or intra-species uncertainty factor of 10, which is commonly applied. And given information that we're developing through PBBK modeling and looking in general at a broad spectrum of literature, we're trying to figure out whether that is actually adequate for chemicals when you're looking at infants and children as well and the metabolic, the kinetic differences, the dynamic differences.

CHAIRPERSON FROINES: I spent all day Saturday

with Dale Hattis. And he's working for EPA on the same -- some of the same issues. So you might want to stay in contact.

OEHHA SUPERVISING TOXICOLOGIST MARTY: Yeah. We're using Dale's papers.

PANEL MEMBER GLANTZ: I'm sure you remember the stochastic modeling exercise that this Panel reviewed, which I think I was the lead on.

OEHHA SUPERVISING TOXICOLOGIST MARTY: Yes.

PANEL MEMBER GLANTZ: And that has a lot of information, and they're related to these issues.

OEHHA SUPERVISING TOXICOLOGIST MARTY: Yes, it does. We're expanding that exposure piece as well to look more at infants. At the time we didn't -- you know, we assumed infants and three-year-olds were essentially the same, knowing that that's not true. So we're looking more carefully at water intake, inhalation rates and so on for smaller subgroups.

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OEHHA SUPERVISING TOXICOLOGIST MARTY: We're also looking at evaluating methods to consider age at exposure for carcinogens. There are a significant number of studies for many carcinogens showing that early life exposure is actually more important than later life exposure, and that you can get the same tumor yield for

short-term exposure of an infant that you can get for chronic exposure of essentially adult animals. So we're looking at that.

And we're also, as I mentioned, evaluating exposures assessment parameters for infants and children.

Next slide.

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OEHHA SUPERVISING TOXICOLOGIST MARTY: So as far as SB 25 and this Panel, this Panel reviews the updates to the list I TACs that disproportionately impact children. This Panel reviews all new and revised reference exposure levels and unit risk factors and the risk assessment methodologies used for these quantitative risk assessments. So you will see our proposed methods for new reference exposure levels, our proposed exposure parameter changes and our proposed methods for cancer risk assessment using weighting factors for age at exposure.

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OEHHA SUPERVISING TOXICOLOGIST MARTY: So these are the things that are just coming down the pike.

And next slide.

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OEHHA SUPERVISING TOXICOLOGIST MARTY: You'll see the update of the list of TACs the disproportionately impact infants and children. And I wanted to mention

that, if you'll recall, there was a Tier 1, and that's the top five that made the list; and there was a Tier 2. We're starting -- the Tier 2 is the starting point for the next update.

PANEL MEMBER GLANTZ: What's the ETS that's finished? It should be on that list too.

OEHHA SUPERVISING TOXICOLOGIST MARTY: Actually I'm glad you brought that up, Stan, because in the document we describe it as a TAC that disproportionately impacts kids and --

PANEL MEMBER GLANTZ: So it's already done, I guess.

OEHHA SUPERVISING TOXICOLOGIST MARTY: It's almost -- all we need to do is once -- it has to get identified as a TAC first. So if the Board identifies it as a TAC in January, then OEHHA Director writes a memo adding it to the list.

PANEL MEMBER GLANTZ: Oh, okay.

OEHHA SUPERVISING TOXICOLOGIST MARTY: So that's the procedures for that.

So we're trying to get these documents ready for public review for this summer. And then the SR -- by the time we get comments and reply to comments, the SRP review wouldn't be until this fall. This is a somewhat optimistic schedule, but we're really going to try to meet

it. And that's all I wanted to say that I --

CHAIRPERSON FROINES: Could you go back a second.

So that the methodology is what we'll be reviewing, and the 15 will come later?

OEHHA SUPERVISING TOXICOLOGIST MARTY: We're going to try to --

CHAIRPERSON FROINES: So you not talking about the -- oh, so you are thinking of updates by this fall?

OEHHA SUPERVISING TOXICOLOGIST MARTY: Yes. We are thinking -- we're trying to --

PANEL MEMBER HAMMOND: All of them.

When we present the methods to you we will have examples of how we used the methods, which go towards that 15 TACs update and also the update of the list. So that's the plan right now.

CHAIRPERSON FROINES: Do you think -- and this is speculative again. Do you think that there is sufficient literature at this point over what we saw a few years ago to really be able to make those decisions? Because part of the problem when we did it the first time was the thinness of the data we had to review.

OEHHA SUPERVISING TOXICOLOGIST MARTY: There's -- yes, there is more literature now. I think part of the constraint with the -- and I'm talking about the list now. Are you talking about the list, the list of TACs?

CHAIRPERSON FROINES: Yeah.

OEHHA SUPERVISING TOXICOLOGIST MARTY: Part of the constraint we had is we could initially only put five chemicals on the list, which meant that there was a lot of argument over which five were the worst. We are not constrained by the number 5 now. There is no constraint. So to us that says, okay, then we can really focus on these other chemicals that we know are present in air or emitted in California. Then we have these data indicating that they are worse actors for young people. So we -- and already that Tier 2 list I think was at least 12 chemicals long, if not more. Maybe 17. Those two numbers are popping in my head. It's quite long. So we do have already sufficient data for those. And on top of that there's been even further study of those compounds that will help us generate some reference exposure levels.

CHAIRPERSON FROINES: So I guess what I'm saying is my view was that the data was extremely thin the first go-around. You're saying it has improved in the --

OEHHA SUPERVISING TOXICOLOGIST MARTY: It has improved.

CHAIRPERSON FROINES: I mean I --

OEHHA SUPERVISING TOXICOLOGIST MARTY: It has improved. And our analyses of what are the factors that make things worse off for children has also improved.

CHAIRPERSON FROINES: Well, that will be an extremely important document to review as a matter of science. So that will be a pretty in-depth discussion as to what criteria. Because there's a lot of almost rhetorical statements about why kids are more at risk that sometimes activist groups use. And so to tie the science down would be very useful.

OEHHA SUPERVISING TOXICOLOGIST MARTY: Right.

You know, where you actually have toxicological data showing that, that's the data you used -- you use to generate your risk estimates. But what we're looking for is not only that, but also any other overarching factors that could be considered, like PBBK modeling, for example, to look at whether there is a difference in kinetics in infants and children versus adults, and whether we can use that in risk assessment or that information to generate default values where the information doesn't exist for a specific chemical, which is most of the time.

CHAIRPERSON FROINES: For example, for arsenic, you know, there's this Michael Wachs work where he shows in utero exposure leads to cancer in adults.

So are you going to -- are you going to, for example, include in utero or postnatal exposures that lead to disease in adulthood as an example of susceptibility of children? Because that would seem logical.

OEHHA SUPERVISING TOXICOLOGIST MARTY: Yes, yes. And, in fact, when we talk about early life exposure resulting in the higher potency, we really aren't talking about childhood cancers. We're talking about adulthood cancers.

CHAIRPERSON FROINES: I think this whole notion of the in utero exposure in the long-term health effects is really so crucial; that the more we can weigh in on that with the literature, the better I think we'll be. Because it's clearly understudied.

OEHHA SUPERVISING TOXICOLOGIST MARTY: Yes, very understudied.

CHAIRPERSON FROINES: But I think it -- I think it's going to be crucial in terms of understanding why people become ill and why they're susceptible.

OEHHA SUPERVISING TOXICOLOGIST MARTY: So we did -- you know, the purpose of this update was to give you a heads-up that this material is coming down the pike, it's going to require your review and it's complicated.

CHAIRPERSON FROINES: Does this -- to the degree that new risk assessments are developed as part of this, does that automatically -- I guess this is for Janette -- does that automatically -- or Bob -- does this automatically lead to a new unit risk value for a TAC if the compound's a TAC? In other words is there a foldover

in to the TAC program?

OEHHA SUPERVISING TOXICOLOGIST MARTY: The foldover is actually -- once something gets on a list -- on the list of TACs that disproportionately impact children, ARB has a trigger to look at either the need for an airborne toxic control measure if one doesn't exist or reevaluating the existing airborne toxic control measure. The statute limits them to having to only look at up to five over a three-year period, I think it is. So, yes, it does. It triggers that.

If we --

CHAIRPERSON FROINES: But we don't have to take -- we have to do the risk assessment again because it's going to become a TAC risk assessment?

OEHHA SUPERVISING TOXICOLOGIST MARTY: Right.

CHAIRPERSON FROINES: It's grandfathered in?

OEHHA SUPERVISING TOXICOLOGIST MARTY: These are all already identified toxic air contaminants, because the SB 25 statute only applied to looking at the list of TACs.

CHAIRPERSON FROINES: Oh, that's right, that's right.

ARB AIR QUALITY MEASURES BRANCH CHIEF BROOKS:

The listing is -- this is Janette Brooks. The listing is actually the compound -- the chemical compound itself, not the unit risk number or the REL. And that's

why Melanie can update the unit risk numbers as she goes and the RELs as she goes.

CHAIRPERSON FROINES: That's Janette Brooks?

How did you know that?

THE REPORTER: I knew who it was already.

ARB AIR QUALITY MEASURES BRANCH CHIEF BROOKS: I identified myself.

CHAIRPERSON FROINES: No, I didn't hear you.

That was a pretty good trick.

This is really going to be important and really terrific. I'm sorry more people weren't here to hear the rest of it. But what we can do is to Xerox a transcript and send it to the people who aren't here.

PANEL MEMBER HAMMOND: Well, they get the transcript -- we all get the transcript anyway.

CHAIRPERSON FROINES: Well, but I was thinking that on this thing we might mark it or something.

MR. MATHEWS: We could single it out.

PANEL MEMBER HAMMOND: Put a note on it.

CHAIRPERSON FROINES: Yeah.

PANEL MEMBER GLANTZ: I think rather than doing that, if you want, I think a memo, because I think the salient points could be put on a couple of pages, whereas a transcript will go on and on.

OEHHA SUPERVISING TOXICOLOGIST MARTY: Well, I

can --

CHAIRPERSON FROINES: Well, Peter, you should send the slides to the people who didn't --

PANEL MEMBER GLANTZ: Yeah, the slides pretty much do it.

MR. MATHEWS: We'll incorporate all that.

CHAIRPERSON FROINES: Well, it's dark and very quiet here, so why don't we -- can I have a motion to -- we don't have a quorum, so I don't know if we need a motion. But let's have a motion anyway.

PANEL MEMBER GLANTZ: So moved.

CHAIRPERSON FROINES: Well, make the motion.

PANEL MEMBER GLANTZ: I move that we adjourn and turn the lights on.

CHAIRPERSON FROINES: Can we have a second?

PANEL MEMBER HAMMOND: Second.

CHAIRPERSON FROINES: All in favor?

(Ayes.)

CHAIRPERSON FROINES: Unanimous.

Thank you.

(Thereupon the California Air Resources Board, Scientific Review Panel adjourned at 2:40 p.m.)

CERTIFICATE OF REPORTER

I, JAMES F. PETERS, a Certified Shorthand Reporter of the State of California, and Registered Professional Reporter, do hereby certify:

That I am a disinterested person herein; that the foregoing California Air Resources Board, Scientific Review Panel meeting was reported in shorthand by me, James F. Peters, a Certified Shorthand Reporter of the State of California, and thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said meeting nor in any way interested in the outcome of said meeting.

IN WITNESS WHEREOF, I have hereunto set my hand this 4th day of January, 2006.

JAMES F. PETERS, CSR, RPR
Certified Shorthand Reporter
License No. 10063