

MEETING
BEFORE THE
SCIENTIFIC REVIEW PANEL
ON TOXIC AIR CONTAMINANTS

MILLBERRY CONFERENCE CENTER
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MONDAY, JULY 17, 2000

12:00 P.M.

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MEMBERS PRESENT

Dr. John Froines, Chairman
Dr. Roger Atkinson
Dr. Paul Blanc
Dr. Craig Byus
Dr. Anthony Fucaloro
Dr. Stan Glantz
Dr. Peter Kennedy

REPRESENTING THE AIR RESOURCES BOARD

Jim Behrmann, SRP Liaison
Peter Mathews, Assistant to the Liaison

REPRESENTING THE DEPARTMENT OF PESTICIDE REGULATION

Paul Gosselin, Chief Deputy Director

REPRESENTING THE OFFICE OF ENVIRONMENTAL HEALTH HAZARD
ASSESSMENT

Dr. George Alexeeff, Deputy Director for Scientific
Affairs

Dr. Melanie Marty, Chief, Air Toxicology and
Epidemiology

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

Dr. Jim Collins, Staff Toxicologist

Dr. Bob Blaisdell, Staff Toxicologist

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P R O C E E D I N G S

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CHAIRMAN FROINES: We will officially open the July 17, 2000 meeting of the Scientific Review Panel.

Is it ringing back there?

So, the first, unless somebody has any particular items to mention at the beginning, we will go with the Agenda.

Peter Kennedy should be arriving momentarily.

We have a quorum.

So, the first item on the Agenda is briefing on recent action by the US Environmental Protection Agency on chlorpyrifos.

DR. GOSSELIN: Thank you. Good afternoon.

For the record, Paul Gosselin, Department of Pesticide Regulation.

The importance of chlorpyrifos, the reason why we are giving the briefing today is to give three things.

One is to summarize the action that EPA announced on June 8 of this year, and what the implications are on that action, and what that means for the chlorpyrifos document scheduled to be presented to the Panel late this year, early 2001.

I think the Panel should have gotten three

1 documents that were released on June 8, that summarizes
2 EPA's action.

3 One was sort of in a fact sheet format, that's
4 called, chlorpyrifos Revised Risk Assessment and
5 Agreement with Registrants.

6 The second one was called, and these are EPA
7 documents, called Questions and Answers, Chlorpyrifos
8 Revised Risk Assessments and Risk Mitigation Measures.

9 The third document that is rather lengthy is
10 called, Overview of Chlorpyrifos Revised Risk
11 Assessment.

12 Essentially what EPA did on June 8, was they
13 completed one of the stages in their risk assessment
14 process, and what they termed their risk assessment
15 process is the re-registration eligibility document
16 process, and this was done under the Food Quality
17 Protection Act.

18 What they did previously in March of 1999,
19 they had their risk assessment out for comment, and it
20 went through a public comment period.

21 This is a pilot process they started under
22 FQPA, to have the risk assessments go out for a public
23 comment period and to have what risk management steps
24 that they are going to take from the risk assessment be
25 subject to public comments.

1 They have even had for the one's that are more
2 complex what they call technical briefings.

3 Yes?

4 I thought you had a question.

5 So, basically on June 8, what they came out
6 with was a sort of a dual notice. One was the revised
7 risk assessment updated from what was released in March
8 of 1999, and to also announce a voluntary agreement
9 that was reached with at least the major producer in
10 the United States of chlorpyrifos, and that is Dow
11 AgroSciences.

12 The voluntary agreement with the registrant is
13 still in the process of being signed off with the other
14 registrants and other sub registrants, is incorporated
15 in the summary of the risk assessment.

16 As you go through what actions EPA took, the
17 one that got the most notoriety and probably the
18 largest impact was to go through a process of phasing
19 out the labeled uses around homes and other residential
20 settings and golf courses.

21 Chlorpyrifos is used throughout the United
22 States for termite control, subterranean termite
23 control. That was one of the major uses that was going
24 to be phased out, but all of the homeowner labeled
25 products, the turf products were going to be phased

1 out.

2 On the agricultural side, they took three
3 actions.

4 One was to limit use on apples to dormant
5 spray only, and the dormant spray is during the winter
6 time. The reason for that, well one of the
7 implications of that is during the dormant season, it
8 kind of precludes having chlorpyrifos residues in the
9 diet.

10 Under the risk assessments, which this was
11 fairly broad and covered a wide range of uses, because
12 chlorpyrifos has many uses, the main exposure driver
13 was from food exposures and the principal exposures in
14 the United States were from apples, grapes, tomatoes.

15 One of the things that they looked at that was
16 a solution to deal with exposures and residues in
17 apples was to limit chlorpyrifos use to the wintertime
18 dormant season spray and not during post bloom
19 applications, where we would have food residues.

20 The second action taken related to ag was on
21 grapes, and they lowered the tolerance, the acceptable
22 level on grapes down to, the way the document breaks
23 down, to typically the use of practice in the United
24 States.

25 They were finding the higher tolerance was

1 approached more closely from imports. So, basically
2 this would not have appreciable impact on use of
3 chlorpyrifos on grapes.

4 The third action was to eliminate chlorpyrifos
5 use on fresh tomatoes.

6 One of the things that occurred was
7 chlorpyrifos use on fresh tomatoes in California is not
8 a major use, and this seems to be mostly going to
9 impact foreign tomato use, particularly in Mexico.

10 So, those are the three main regulatory
11 outcomes of that. The rationale as you go through
12 their overview of the risk assessment, and sort of the
13 second aspect I want to talk about is what that means
14 for our document.

15 EPA's new document -- and all of this again is
16 out for a 60-day comment period right now, to see if
17 there are other mitigation measures that EPA needs to
18 take into account. It does raise a couple of issues
19 for us.

20 One is the end point selection that they used
21 was plasma cholinesterase. They did choose for a
22 variety of exposure scenarios end points for the route
23 of exposure, so they have oral end points, inhalation,
24 dermal, depending on if it's occupational, non-
25 occupational.

1 But they did choose cholinesterase inhibition,
2 they were from animal studies, and there were no human
3 studies.

4 They also, probably the most important thing
5 they did is, from the March 1999 risk assessment where
6 they had a three-X additional safety factor from the
7 FQPA factor. This last revision in February they went
8 back to the 10-full safety factor, the additional
9 factor in FQPA.

10 The rationale they have is that they looked at
11 some additional data and found that there was some
12 evidence in at least one data set to show exposure to
13 chlorpyrifos increases susceptibility in infants and
14 children, and it warranted the extra 10-X factor.

15 DR. FUCALORO: What did it do?

16 DR. GOSSELIN: They looked under the Food
17 Quality Protection Act, the EPA was instructed to --

18 DR. FUCALORO: You mentioned one data set they
19 noticed, and I'm not sure I understood what they
20 noticed.

21 DR. GOSSELIN: That there was an increased
22 susceptibility to chlorpyrifos exposure in the studies.

23 DR. FUCALORO: Meaning that there was reduced
24 levels of cholinesterase in the plasma?

25 Is that the end point?

1 DR. GOSSELIN: Actually, I will have to --
2 page 3, if you look at the overview of the chlorpyrifos
3 risk assessment, it was developmental neuro toxicity.

4 DR. FUCALORO: Right.

5 DR. GOSSELIN: So, because of that study they
6 went back to the additional 10-X factor.

7 One of the things that, and this is going to
8 be important for our document, is to incorporate the
9 issues that EPA raised, not only on end point
10 selection, on the studies they used, which essentially
11 is all the studies that we have in-house, but also how
12 they have evaluated to add the extra 10-fold safety
13 factor.

14 This has been -- for chlorpyrifos is going to
15 be a major issue for us because this has been the extra
16 safety factor, is something that we have kept an eye on
17 with EPA, and up until now they have not made such a
18 major step as they have in this risk assessment.

19 So this is also going to play some major
20 issues for us in how we respond and deal with similar
21 safety factors.

22 Because if you take into account their use of
23 plasma cholinesterase, which was 10-fold different than
24 if we used clinical signs, add an additional safety
25 factor of 10 extra or above, 100 fold from the get-go,

1 from where we would typically assess the risk at. And
2 so some of this has to take into account how our
3 assessments are conducted, post chlorpyrifos risk
4 assessment.

5 I think one of the things that we are looking
6 to do is keep the chlorpyrifos toxic air contaminant
7 document on track, but there's going to have to be a
8 far more rigorous explanation in comparison and
9 critique of this risk assessment in our toxic air
10 contaminant document.

11 CHAIRMAN FROINES: I have a question about
12 that.

13 I don't know, George, Martha Escutia, what the
14 bill is called?

15 Do you know the numbers?

16 DR. GOSSELIN: It's SB 25.

17 CHAIRMAN FROINES: SB 25, you are affected by
18 SB 25 -- my question is to Paul, which is, are you
19 affected by SB 25?

20 DR. ALEXEEFF: No.

21 SB 25 -- this is George Alexeeff with OEHHA.
22 SB 25 has to do with toxic contaminants as well as
23 ambient air quality standards but it's for those
24 substances in their non-pesticidal use.

25 CHAIRMAN FROINES: So, the issue of the

1 10-fold safety factor is an issue that you need to be
2 concerned with in terms of that legislation, but it
3 doesn't affect --

4 DR. ALEXEEFF: Does not directly affect the
5 pesticides that Paul has to deal with.

6 DR. GOSSELIN: Except in, we have been talking
7 at length, not only about the FQPA extra uncertainty
8 factor, but also the SB 25 in that we are going to have
9 to closely coordinate and keep track on OEHHA's
10 progress on this, because Cal EPA, the guidelines and
11 policies in most instances should be fairly close,
12 especially if we are dealing with exposure to chemicals
13 in the environment.

14 So, the crafting of the legislation doesn't
15 really preclude us from taking a real close hard look
16 and keeping track of where guideline setting and
17 scientific procedures are going to be consistent among
18 the agencies.

19 CHAIRMAN FROINES: I think that is right.

20 If at some point George and Melanie are coming
21 back to us with significant alterations in any risk
22 assessment approaches based on SB 25, and you are not
23 in line, that clearly would raise some question of what
24 kind of coherence there would be in the state.

25 DR. ALEXEEFF: It may behoove us at some

1 future meeting for us to give you an update of what our
2 plans are for SB 25, so you can get a sense of what to
3 expect over the next couple years regarding that,
4 because it will have some impact, it will be a whole
5 new area or data that the Panel will look at.

6 CHAIRMAN FROINES: It will dramatically affect
7 your risk numbers, isn't it?

8 DR. ALEXEEFF: We don't know.

9 In some cases it may. It may in a lot of
10 cases, but we're not sure.

11 CHAIRMAN FROINES: Thank you, George.

12 DR. GOSSELIN: And I think as the chlorpyrifos
13 document comes before the Panel, some of these issues
14 will come to a head sooner than later because on one
15 end you have a federal risk assessment that has,
16 depending on the end point selection, it could be 10 or
17 100 times different than what our assessment is. And
18 the value of that is going to have to -- for us to
19 really take a look at our procedures and how they
20 mirror the federal government procedures.

21 They did typically -- one of the other issues
22 that was raised about the breadth of the risk
23 assessments typically went under EPA's risk
24 assessments. They do a fairly rigorous dietary risk
25 assessment that matches what our procedures are.

1 We will look at some methods to look at water
2 exposures, if there are any, and also some residential
3 exposures using default assumptions because of the lack
4 of exposure data.

5 One thing that usually is lacking in EPA risk
6 assessments is a real hard look at worker exposure and
7 field worker exposure, where we usually spend a bit
8 more time on that.

9 It does appear, and staff is going through
10 with this, that EPA did take a thorough look at a wide
11 range of worker exposure patterns and other
12 non-occupational exposures.

13 The one thing that still isn't addressed in
14 EPA's risk assessment is ambient air exposures.

15 I think this is, not only for us but
16 federally, a new area that we are trying to bring to
17 their attention with some of the data that the Air
18 Board has been providing to us in this process.

19 That is one area that is not covered by this
20 assessment.

21 The one bottom line is that the, although they
22 did take major action on consumer products, those
23 consumer products are going to remain in use until, or
24 are at least available for sales until December of
25 2001.

1 As described, the three actions on the three
2 crops is not going to appreciably affect what's labeled
3 for use in California.

4 So the two to three million pounds of
5 chlorpyrifos used annually in the state is pretty much
6 not going to change because of this decision. There
7 might be some other reasons for changes in chlorpyrifos
8 use rates.

9 We still haven't decided. We are still going
10 through the issues on any comments we are going to make
11 back to EPA. Our staffs have been in constant
12 communication over the past couple of years on their
13 assessment and our assessments on sharing the
14 information and the approach.

15 There is a whole range of compliance issues on
16 the enforcement end, on how they actually crafted this
17 arrangement and phase-out of uses that we have a lot of
18 issues with on how it could actually be carried out.

19 But this is definitely going to cause us to
20 have to go back and rebolster how our risk assessment
21 was actually crafted to address and critique this
22 action.

23 DR. BYUS: Craig Byus. Are you going to
24 consider this extra safety factor for all organic
25 phosphates, or does EPA sort of only consider

1 chlorpyrifos?

2 We were under the EPA for methylparathion, but
3 even in their most recent EPA document on that, they
4 were still questioning the data as being valid. And now
5 after reading this, it just, quickly here, it seems
6 like they have completely changed their thinking. Or
7 is it just my interpretation?

8 Is that my interpretation?

9 DR. GOSSELIN: Yeah.

10 The factor -- actually they started out with
11 an extra three-X factor and then this last run went to
12 an extra 10-X. I think now that they have started to
13 actually pick the pace up on the OP, how they are
14 making the decisions on when and under what conditions
15 to apply, the extra uncertainty factor is coming into
16 focus.

17 Up until this point, there are no guidelines
18 or procedures for them to follow, which has kind of
19 left us somewhat in the dark on, you know, how we
20 should actually follow suit.

21 I think that is where, as George came up and
22 mentioned, under SB 25, to put the guidelines and
23 procedures in place first is a wise step.

24 They have had a lot of papers before their
25 Science Advisory Panel to kind of flush these out, but

1 they are not hard and fast, so it basically comes down
2 to a compound by compound call.

3 The other issue that is also going to be a
4 major one is that there have been stories in the press
5 that it looks like EPA is getting ready to finalize
6 their decision regarding use of data from human
7 testing. They are still awaiting their report from
8 their Science Advisory Panel on that.

9 But supposedly their draft internal policy got
10 out, and essentially the way that the articles have
11 read and what the practice has been in the last year is
12 not to consider or use any data to derive end points
13 using any human subjects, so only to rely on animal
14 data.

15 We have gotten a number of inquiries to follow
16 suit.

17 DR. BYUS: The other question is simply if
18 agricultural use of this is going to be restricted?
19 Considering there are 39 other organophosphates around,
20 will agricultural use just be increased in one of the
21 other organophosphates?

22 Just out of curiosity.

23 DR. GOSSELIN: Like I said, the three major
24 actions that were taken, eliminating the tolerances of
25 uses on fresh tomatoes, our information indicates that

1 that is not a major use in the United States.

2 Dormancy in spray for apples, to allow that
3 use is consistent with the practices that we have
4 found, and lowering the tolerance on grapes is going to
5 reflect the use practice in the United States.

6 The other crop uses are still going to
7 continue.

8 The other restrictions that are placed on
9 packaging and licensing, and that is --

10 DR. BYUS: But it's going to be restricted
11 just for chlorpyrifos, not for the other organic
12 phosphates?

13 DR. GOSSELIN: Right.

14 But that probably isn't going to be a major
15 factor in whether people choose to use this as the
16 means to control whatever pests are on their crop.

17 CHAIRMAN FROINES: Does that mean on grapes in
18 California there is going to be another pesticide that
19 is going to be used more widely? I think that's what
20 Craig was asking.

21 DR. BYUS: That is likely to be an
22 organophosphate and have similar, if not identical,
23 toxicity.

24 DR. GOSSELIN: No, because they, I would say
25 even under this they would still operate the way they

1 have been.

2 Basically what they would need is to hold a
3 private applicator certification, which most of the
4 growers do anyway, because some of the other products
5 they use require that, and to get a permit from the
6 county ag commissioner, which they are getting the
7 permits from them for other materials.

8 So, even if you are a grower who only needed
9 to get -- deal with those extra regulatory requirements
10 because of this, to do that probably would not preclude
11 you from doing that, because both of those things do
12 not cost anything.

13 DR. FUCALORO: In effect, agriculturally
14 you're saying that it has no impact, but certainly on
15 the homeowner, it has impacts, and golf courses, and
16 the replacement for that, what is being anticipated?

17 In other words, coming back to the same thing
18 that Craig was talking about, what do people see as
19 replacement products for home?

20 DR. GOSSELIN: Termiticide use, there are a
21 number of new bait stations out. You've probably seen
22 ads, where they have the center core, and other things
23 coming into use and it seems like that is going to be a
24 lot of the movement.

25 There are some other pyrethrin-based

1 materials, and I think the homeowner products, too, use
2 around homes is also going to go that way.

3 For now, there is a wide range. If you go for
4 turf, diazinon granules are a major use, and those
5 assessments are slated also to come up.

6 This is probably one of the major organic
7 phosphate uses for ag and non ag, but there are others
8 to come.

9 CHAIRMAN FROINES: I just have one quick
10 question, because Craig and Tony's questions raised an
11 interesting kind of issue.

12 You just, I think, finished saying there is
13 not going to be a major impact on California crops in
14 use. But at the same time you are planning to bring a
15 document forward on chlorpyrifos, presumably the end of
16 the year or early next year, we find it toxic, yet we
17 recommend it as a toxic air contaminant and then
18 undergo the regulatory process.

19 So, then the question comes, what is the
20 regulatory process if there is going to be no impact?

21 There would likely be an impact if there's a
22 regulatory process, otherwise the question could be
23 asked, why bring it forward?

24 DR. GOSSELIN: No. I said EPA's action didn't
25 have any impact on the ag use.

1 What I understand you're saying is, that's why
2 this, after hearing the EPA action, we definitely have
3 to bring this document to closure and move forward
4 because the ag use is going to continue. If there is a
5 need to control what air exposures people have, this is
6 going to be the means to do it.

7 EPA's risk assessment was not the means to do
8 that. They did dietary. They did water. They did
9 occupational and some residential, but not anything
10 addressing ambient air exposures.

11 The document we will bring forward will
12 actually be a missing piece of the puzzle that EPA did
13 not address.

14 CHAIRMAN FROINES: Thank you.

15 So, the next item on the agenda is the review
16 of the draft report, technical support document
17 exposure, and technical assessments analysis.

18 I think, by the way, George and Paul, this
19 issue of SB 25, it would be good to come forward and
20 have a meeting with the Panel in the same sense of the
21 EPA Science Advisory Committee, so that you bring to
22 the Panel how you want to approach it, and the Panel
23 can give you feedback.

24 Because if you then come forward with a
25 chemical and the Panel disagrees violently with the

1 approach, that would be a problem.

2 So, it probably makes good sense to have a
3 first proposal interaction and then we get into the
4 specific chemicals.

5 DR. MARTY: We have a short presentation, and
6 essentially what we are going to do is sum up the
7 changes that we are suggesting to make, per public
8 comments and per comments received from Dr. Friedman
9 and Dr. Glantz so far, and then I thought we would get
10 input from the other Panel Members on it.

11 CHAIRMAN FROINES: So, when you are finished,
12 we will go through the assignments for the Panel.

13 DR. MARTY: Right.

14 The first slide is basically a reminder of
15 what we are talking about.

16 This document is Part IV of the Air Toxics Hot
17 Spots Risk Assessment Guidelines, and it deals with
18 exposure assessment and Stochastic Analysis of
19 Exposure.

20 The document was released for a 90-day public
21 comment period December 31, 1996, and we responded to
22 public comments and incorporated changes in the
23 document which we went over the last meeting.

24 We revised the draft and released it to the
25 SRP for their review, and also for a 30-day public

1 comment in March.

2 We received one public comment, which we will
3 be incorporating into the document, in addition to the
4 Panel Members' comments.

5 Dr. Friedman could not be here today, so he
6 sent comments that I have handed out to everyone with
7 our responses.

8 We discussed our responses with Dr. Friedman
9 over the telephone, and he agreed and was satisfied
10 with what we were saying we would do to respond to him,
11 and he told me I could relay that information to the
12 Panel.

13 Next slide, Andy.

14 Most of Dr. Friedman's comments were really
15 points of clarification that he would like us to make
16 clear in the document.

17 There was one point that he made that I think
18 we need to bring to the Panel and ask for some
19 assistance on what we should really do, and that was in
20 respect to treating mercury as a multipathway
21 pollutant. That is, not just looking at exposure by
22 inhalation, but looking at exposure by other non-
23 inhalation pathways.

24 We have always done this, and then in Appendix
25 E, we describe a method to try to estimate how much of

1 a chemical ends up on particles, and the particle part
2 is important because that is basically where you are
3 getting your non inhalation exposures.

4 Mercury, when plugged into that model, comes
5 in below the cutoff. So, the model tells you not to
6 treat it as a multipathway pollutant.

7 There are a couple of issues with that, and
8 that is that what goes into the model is the vapor
9 pressure of elemental mercury.

10 Not all of the emissions from Hot Spot
11 facilities are elemental mercury. Some of them are
12 salts. So, that model then does not work for the
13 mercury salts that are emitted.

14 The other concern that we had is whether or
15 not some of the elemental mercury vapor, whether it's
16 in vapor form or actually adhered to a particle, could
17 react with anything to form a salt.

18 We know that mercury is an important chemical
19 environmentally. It's basically a ubiquitous
20 pollutant. A lot of mercury, for example, in the Great
21 Lakes, may not just be from point sources but may
22 actually be atmospheric deposition.

23 So, we thought that despite the fact it didn't
24 actually fit the model that we would treat all mercury
25 emissions by a multipathway analysis.

1 One possible thing that we could do is try to
2 get the facilities to speciate their mercury emissions,
3 and for mercury salts, they would definitely have to
4 treat them by a multipathway analysis, but maybe not
5 for elemental.

6 I am not particularly comfortable with that
7 because of the fact that mercury is a ubiquitous
8 contaminant. If it is deposited either by dry
9 deposition or wet deposition, even as elemental, you
10 end up with mercury in the sediments, you end up with
11 methylated mercury and so forth.

12 So, my question to the Panel really is, what
13 would you do, and what is your opinion of how mercury
14 should be treated?

15 Is there a possibility for elemental mercury
16 to react to form mercury salts in the air?

17 I don't know.

18 DR. ATKINSON: Yes, there is.

19 DR. BLANC: I thought that the only reason
20 that you were going through the Stochastic modeling, as
21 far as inhalation at least was concerned, was for
22 carcinogens. Is that not true for the whole body
23 exposure?

24 DR. MARTY: This actually is true for the
25 Stochastic element in the document, but the document

1 also deals with just general exposure issues whether
2 we're doing it point estimate or Stochastic.

3 So, that's where this comes in in importance,
4 for our point estimate approach, are we going to deal
5 with mercury as a multipathway pollutant or not?

6 We think we should. It does not fit our
7 model, but our model is lousy.

8 DR. BLANC: Then why don't you, because it's
9 more conservative from the public health standpoint,
10 correct?

11 DR. MARTY: Correct.

12 DR. BLANC: So why don't you?

13 DR. MARTY: Okay.

14 CHAIRMAN FROINES: What are the implications
15 of that?

16 DR. BLANC: Probably somewhat more restrictive
17 estimates because you'd have a higher estimate of
18 exposure for any given release, because you'd assume
19 that there would be more propensity for some of it to
20 be ingested as well as inhaled. And maybe what John
21 is asking, roughly we're talking about a 10 to 20
22 percent estimated increase in exposure, we're not
23 talking about ten times greater exposure.

24 It would marginally increase the total
25 exposure via the air borne releases, is that correct?

1 DR. MARTY: Yes.

2 I think most of the metals, 50 percent to 200
3 percent increase in total dose, if you look at non-
4 inhalation pathways. Of course, it totally depends on
5 the scenario you're looking at, but that's a general
6 rule of thumb.

7 Some of the organics, it's much higher. Like
8 dioxins, you're talking 10-fold.

9 DR. BLANC: How about for metals?

10 DR. MARTY: For metals, it's less than
11 two-fold, generally.

12 DR. BLANC: Fine.

13 CHAIRMAN FROINES: Does this have implications
14 for monitoring requirements on industries?

15 DR. MARTY: No, it does not.

16 CHAIRMAN FROINES: So, they are not going to
17 have to go out and actually speciate and look in the
18 soil based on their modeling efforts?

19 DR. MARTY: No.

20 CHAIRMAN FROINES: Okay. So, nobody else
21 seems to want to jump in, so, go ahead.

22 DR. MARTY: Okay. Another question that Dr.
23 Friedman had that I thought was interesting, because I
24 do not think like he does, but we have a fish
25 consumption --

1 DR. FUCALORO: That is interesting.

2 DR. MARTY: We have a fish consumption rate
3 distribution in our document, and we also talk about
4 point estimates, and we base it on a survey of fish
5 consumed by people who fish in the Santa Monica Bay.

6 He thought that a source of bias might be an
7 understatement of fish consumption for fear of being
8 caught catching more than the limit, and that is a new
9 one on me. No one that we discussed this with --

10 DR. GLANTZ: Is he a fisherman?

11 DR. MARTY: He says that he has fished before,
12 but he hasn't caught a lot.

13 DR. FUCALORO: It is plausible.

14 DR. BLANC: It is also plausible for somebody
15 to overestimate to try to make themselves sound like a
16 more successful fisherman.

17 DR. MARTY: It's the old fish story bias --

18 DR. FUCALORO: For someone who fishes with a
19 flashlight, I can tell you --

20 DR. BLANC: Since there is no way to estimate
21 that, all you can do is what you are suggesting, which
22 is to simply acknowledge that that is a possibility,
23 but I don't believe there is any factor you can put in
24 your model that would take that into account. I think
25 you just have to acknowledge the limitations.

1 DR. MARTY: Agreed.

2 It does point out the limitations of surveys.

3 CHAIRMAN FROINES: We will ask Sander
4 Greenland to incorporate the notion of fish bias in his
5 next textbook.

6 DR. MARTY: There were a few other things that
7 came up with respect to the fish consumption rate
8 distribution.

9 One of those is we actually talked to Steve
10 Samuels, at U.C. Davis, since he does a lot of survey
11 work, and he's pretty good at figuring out the biases
12 in a survey.

13 We talked to him about the way we had
14 corrected for fishing frequency or the avidity bias
15 issue, and he was fine with the way we had corrected
16 for it, but he did suggest other corrections that we
17 could make, including correcting for sampling location
18 frequency, because not all the sample locations were
19 sampled the same number of times.

20 So, he suggests weighting the results to even
21 that out.

22 Also, some of the sampling locations, the
23 sampling took place over four hours, some of it was six
24 hours, some three hours, so, you're introducing another
25 bias there.

1 We will go ahead and make these corrections.
2 We expect them to be very modest and not change the
3 number very much.

4 The big correction was the fishing frequency,
5 the avidity bias, which we've already done.

6 So, I would be happy to work with Dr. Glantz
7 on the rest of those corrections, but we really don't
8 think it's going to be a big deal.

9 Another comment that came from Dr. Friedman
10 and also it came from other people, is that the way we
11 -- Gary's comment was that the body weight standard
12 deviation seemed too low when he looked at it.

13 The problem is that conventionally people who
14 do Stochastic Risk Assessment express the distribution
15 as the mean and standard deviation of the natural log
16 transformed distribution.

17 So, when you look at it, you can't just take
18 the anti-log, and that is the number. You need to use
19 a formula that was published in Burmaster and Hull,
20 '97, to calculate the arithmetic mean and standard
21 deviation, unless you're really good at thinking in log
22 transforms base.

23 So, we are going to go ahead and add the
24 formula into the text. We got that comment from some
25 other people who were reviewing the document

1 internally.

2 Okay. Some other changes that result from Dr.
3 Friedman's and Dr. Glantz's comments were editing
4 Chapter 1 and a few other places for readability, per
5 Dr. Friedman's comments.

6 I think you can tell that Chapter 1 was
7 written by a committee.

8 We are adding figures of the cumulative
9 distribution function in Chapter 3 and elsewhere, per
10 Dr. Glantz's request, and we are also clarifying
11 language in several places per comments from Drs.
12 Friedman and Glantz.

13 Finally, there are a few other changes. There
14 are some formatting glitches and typos, including Table
15 4.4. I apologize to the person who had to review that.

16 The columns were offset. You could tell by
17 looking at it. I could probably tell easier than most.
18 Anyway, that was a problem.

19 Table 7.13, which described the point
20 estimates for food consumption rates, that table was an
21 old table, which we inadvertently left in the draft
22 that we gave you guys. So the numbers did not match
23 the source tables, if you tried to match them. Some of
24 them were just a little off and some way off.

25 So, we have actually, Peter is passing out the

1 corrected version for that table, so that needs to get
2 fixed.

3 Then finally, there were minor changes to
4 Section 2, which described the air dispersion modeling.
5 These were primarily clarifications per comments from
6 the Ventura County Air Pollution Control District.

7 That is all I have to add in for now.

8 I guess we could go on to the other Panel
9 Members' comments, or if Dr. Glantz wants to add in
10 more about his comments.

11 CHAIRMAN FROINES: Stan is the lead, so we
12 should turn it over to him first, in any case.

13 DR. GLANTZ: I don't have a lot to say.

14 I've been working with OEHHA for a long time
15 on this document. It has been through multiple
16 iterations, and some of you may remember was the
17 subject of a certain amount of controversy with the now
18 departed Rick Becker.

19 I think that it is a very good piece of work
20 now. I think this is going to be a very important
21 document, and all of the comments that I made which I
22 think I circulated to the Panel by e-mail, were mostly
23 points of clarification. There was nothing
24 substantive.

25 The one place where I thought I had them with

1 some naughty things on water, it turned out was just an
2 editing error, and a little bit of Beckerisms hadn't
3 been purged.

4 But I don't have much to add. I think that
5 unless somebody here has something to say that I
6 missed, which happens all the time, I think we can
7 approve this.

8 As far as I'm concerned, I think the document
9 is ready to approve, subject to the points that Melanie
10 raised, which I don't think need to come back to the
11 Panel.

12 They are all just clarifications and matters
13 of how things are presented to make the evidence a
14 little easier to understand.

15 But I think it is really an excellent piece of
16 work.

17 CHAIRMAN FROINES: I lived through the lead
18 document with Stan. We spent an entire day going
19 through comments, for you to take approximately a
20 minute and a half maybe should go down in the record as
21 a momentous event.

22 DR. GLANTZ: Fortunately, the problem is not
23 here anymore.

24 The reason that I had to go through all that
25 stuff on the record was -- as pointed out, this has

1 been gestating for over four years.

2 I will be embarrassed when the other Panel
3 Members point out the obvious blunders that I missed,
4 but as far as I'm concerned, I think it is ready to go.

5 CHAIRMAN FROINES: Okay. Tony and Roger were
6 the first people on the list for Section 2.

7 So --

8 DR. ATKINSON: I have to confess that I have
9 not read it in detail, so at this point I have no
10 comments.

11 CHAIRMAN FROINES: Tony?

12 DR. FUCALORO: Well, I'd say the same, because
13 it is true. The question -- I know Stan probably, and
14 everyone involved, is eager to get this passed.

15 DR. GLANTZ: If there is something wrong, I am
16 not so eager that I want it out wrong.

17 It's just I could not find any more to pick
18 on.

19 DR. FUCALORO: And you tried.

20 DR. GLANTZ: Of course, I tried.

21 I almost have it memorized.

22 DR. FUCALORO: I'll go along, I have seen it
23 several times before.

24 I am happy to go along.

25 CHAIRMAN FROINES: Well, let's ask Paul about

1 Section 3, or Section 3, Appendix F and K.

2 DR. BLANC: I am just going to deal with
3 Section 3, the breathing thing, and I want to ask a
4 couple of questions to make sure that I understood it,
5 and then from my questions, I think it will be clear
6 that there are some ways in which it could be laid out
7 in the beginning of the Section that would be a little
8 clearer.

9 If I understand it correctly, what this
10 Chapter does is present a lot of different groups of
11 various estimates of breathing rates, all of them
12 expressed as a volume per breathing per weight, for
13 children or for adults at various activity levels.

14 One of those studies is a study that the Air
15 Resources Board itself had done, and then you take the
16 study that the Air Resources Board had done and link it
17 to the survey that the Air Resources Board did of
18 various people's activities, assigning to those
19 activities, fixed levels of breathing, and then making
20 a distribution of what kind of breathing rates you come
21 out to?

22 DR. MARTY: Correct.

23 DR. BLANC: It's actually impossible to figure
24 out that that's where this Chapter is going until you
25 slog all the way through it, and even then it's not so

1 clear that that in fact is what you did.

2 It's also not clear, and you don't help your
3 cause any, if I understood correctly, the EPA which had
4 one set of standards, is now going to reject those and
5 use a much lower amount of breathing, again expressed
6 in a volume per day per average weight person.

7 That is page 3-5, first paragraph, second
8 sentence.

9 "The U.S. EPA 1997 is currently recommending
10 an average breathing rate of 11.3 meters per day for
11 adult females, and 15.2 for adult males," which is
12 quite different than their 1985 and 1989
13 recommendation.

14 Is that correct, did I understand that
15 correctly, or did I misunderstand that?

16 DR. MARTY: I think in the past they primarily
17 used 20 cubic meters per day for a 70 kilogram person
18 and what they are going to --

19 DR. BLANC: They are going to cut it in half.

20 DR. MARTY: What they are going for is an
21 average value.

22 The EPA is also moving towards expressing
23 risks as risk to the average exposed person and risk to
24 a high end person. What they want to do is use these
25 numbers for the average female and the average male.

1 DR. BLANC: But then you see, later on when
2 you start going through the various groups, when you
3 talk about the EPA you say the U.S EPA recommends using
4 20 meters. So, you're using the present tense even
5 though you earlier in the page said that they are not
6 going to be doing that anymore.

7 There's no where a sort of summary thing where
8 you say, therefore as you will see, we have arrived at
9 a value which not only is greater than the previous EPA
10 value, but will be approximately twice as great as the
11 average value that the EPA is going to, but we feel
12 that our detailed analysis supports this two-fold
13 difference.

14 If that's, in fact, where you're going.

15 But again, I could not tell if that was
16 between the lines. It was not explicit enough to me.

17 DR. MARTY: I think the problem arises because
18 we were trying to describe where EPA was, and during
19 the time of writing this document, they changed their
20 position.

21 DR. BLANC: What happened was you added the
22 sentence, but it did not impact anywhere else, and so
23 the reader is left thinking, did they say that or
24 didn't they say that?

25 DR. MARTY: Okay, we'll clean that up.

1 DR. BLANC: And what is the policy implication
2 of the number that you come up with at the end?

3 Did I understand it correctly?

4 DR. MARTY: I think you understood it
5 correctly.

6 Part of the problem is we express our
7 breathing rates in liters per kilogram, body weight
8 day. They are expressing them in cubic meters per day.
9 So, we need to do some translation based on body
10 weight.

11 DR. BLANC: That's the problem throughout
12 here, because every table has different units. It is
13 true, it is hard to go back and forth.

14 DR. MARTY: We tried to on the last page and
15 paragraph form note that, for example, for a 50-
16 kilogram person breathing X liters per kilogram day,
17 that is equivalent to X cubic meters.

18 So maybe the thing to do is tabulate that.

19 DR. BLANC: By the way, for example Table 3.1,
20 which is titled Minute Volumes, they're not Minute
21 Volumes because they are expressed in meters per hour
22 -- I'm sorry, liters per minute, I take that back.

23 So that is one problem is that the units go
24 back and forth. But fundamentally if you would just
25 lay it out in the beginning where it is you are going

1 with this Chapter, and in the end why it is -- first,
2 that the values are different than the old EPA values,
3 although not horribly different, but quite a bit
4 different than where EPA seems to be going, even with
5 the mean values.

6 The other thing that is sort of thrown out
7 there is page 3-9, there is a single sentence, the end
8 of the last paragraph that says, "The implication is
9 that for a given activity and concentration in air,
10 children are experiencing higher doses on a milligram
11 per kilogram body weight basis than adults."

12 But also, they are probably experiencing, even
13 with the lower breathing rates, a bigger exposure in
14 milligrams per cubic meter of surface area, aren't
15 they?

16 DR. MARTY: Per square meter of surface area,
17 yes.

18 DR. BLANC: Wouldn't that matter more for
19 carcinogens, which is the only thing we are using this
20 for, potentially?

21 DR. MARTY: Actually Dr. Friedman brought that
22 up too, because people tend to look at scaling on a
23 milligram per surface area basis, we do use that when
24 we do quantitative risk assessment for cancer, but we
25 do it on the dose end, the dose response assessment

1 end.

2 So, if, for example, we are trying to look at
3 an animal study and scale that up to humans, we scale
4 on the body weight to the two-third power basis, which
5 is essentially the surface area scaling. But when we
6 calculate dose, we calculate it on a milligram per
7 kilogram body weight basis.

8 So that is why all of our stuff is based on a
9 per kilogram body weight, all of our exposure factors.

10 DR. BLANC: So therefore, you aren't
11 underestimating exposure for children by using these
12 lower breathing rates per kilogram, because you have
13 already taken that into account?

14 DR. MARTY: Right.

15 DR. BLANC: Do you say that somewhere,
16 somewhere else in the text?

17 DR. MARTY: I don't think so. We probably
18 should.

19 DR. BLANC: You could probably add a couple of
20 sentences after that sentence about the implications
21 of, and then, this may also sound like a silly
22 question, but let me see if I understand this
23 correctly. In the end you come up with an average
24 breathing rate over an entire lifetime which integrates
25 your rate when you were a kid and then your rate when

1 you are an adult.

2 Is that what you do?

3 DR. MARTY: Right.

4 For the purposes of doing a lifetime risk
5 assessment, we simulate a distribution and then take
6 point estimates off that distribution for the point
7 estimate approach.

8 When we simulate the distribution, the model
9 is picking points from the children's distribution and
10 points from the adults' breathing rate distribution to
11 get a lifetime breathing rate distribution.

12 So the values in the end are higher because
13 you have incorporated the higher breathing rates in
14 children.

15 DR. BLANC: Breathing rates for children were
16 actually lower in liters per kilogram.

17 DR. MARTY: They are higher.

18 One way to take a look at it is to take a look
19 at Table 3.21, which has the point estimates for adults
20 and kids. Kids less than 12 years, the mean breathing
21 rate is 452 liters per kilogram body weight day,
22 whereas that for adults, which here is defined as
23 greater than 12, is 232, and ditto, the high ends are
24 580 versus 380.

25 DR. BLANC: Aren't all the values earlier on

1 less for the children?

2 DR. MARTY: If you express it in cubic meters
3 per day, yes.

4 DR. BLANC: Oh, never mind. Forget that.

5 And then the rationale for the 85th percentile
6 was explained elsewhere in the document?

7 DR. MARTY: Actually, what we were just
8 wanting to point out was that the high end estimate we
9 took, we basically took 95th percentile off the
10 distribution for all those parameters that we had the
11 distribution for.

12 What we wanted to point out was if you use our
13 distribution and compare EPA's old method of 20 cubic
14 -- and our old method of 20 cubic meters per 70
15 kilograms, you are actually hitting the 85th percentile
16 on our distribution.

17 So it is not as high end as we are choosing.

18 DR. BLANC: You should make that more clear
19 because I did not understand that.

20 DR. MARTY: Okay.

21 DR. BLANC: And then my final question, and
22 this may also be fairly ridiculous, but I just thought
23 I would ask it, all of these breathing rate things in
24 California are done at sea level?

25 DR. BLAISDELL: The breathing rates study was

1 done in Davis, so pretty much sea level, about 70 feet,
2 I think.

3 DR. MARTY: Yeah, the measurements of
4 breathing rates at specific activities was done in
5 Davis.

6 DR. BLANC: So, you have to take into account
7 what percentage of the California population live at
8 altitudes where their breathing rates might be higher
9 and whether or not they are higher disproportionate to
10 the partial pressures?

11 I guess if it was all completely in line, then
12 there would be less concentrations of these things in
13 the air too, but sometimes when the oxygen is lower it
14 stimulates breathing rate, which might be faster
15 physiologically than the decrease in pressure, and
16 therefore you just may be breathing more rapidly.

17 I hate to ask a question like that.

18 DR. MARTY: We did not try to account for
19 that.

20 DR. GLANTZ: That is actually a very good
21 question.

22 Do you think that would change things?

23 DR. BLAISDELL: People that reside at
24 altitudes though adapt, and their breathing rates tend
25 to fall if they live at altitudes.

1 DR. FUCALORO: Even though they have a lower
2 partial pressure of oxygen in the air?

3 DR. MARTY: I think --

4 DR. BLANC: There is an adaption, but I'm not
5 sure if it's completely -- are you sure about that? We
6 should double check that.

7 DR. BLAISDELL: You probably wouldn't find
8 people above about 7,000 in California.

9 DR. MARTY: Too many.

10 DR. FUCALORO: You always use the
11 barometric --

12 DR. MARTY: The other issue is the vast
13 majority of the facilities are down in the valleys.

14 DR. BLANC: I also don't think you need to
15 have all that verbiage about we use the stats to do a
16 univariant analyses, just say we analyzed the
17 distribution.

18 DR. MARTY: Stan made us put that in.

19 (Laughter.)

20 DR. GLANTZ: No, I didn't.

21 DR. BLANC: That would be different if you
22 were doing some very sophisticated statistical analysis
23 where the computer software program you use might have
24 implications --

25 DR. BLAISDELL: We were a little new to this

1 sort of thing.

2 DR. BLANC: That's it.

3 CHAIRMAN FROINES: Stan, did you want to say
4 anything about soil ingestion rates?

5 Are you done for the day?

6 DR. GLANTZ: I had a couple of points that I
7 gave the staff.

8 It's nothing worth taking the Panel's time.

9 CHAIRMAN FROINES: Okay.

10 Peter, breast milk consumption rate.

11 DR. KENNEDY: I did a preliminary review of my
12 grandchildren so I could be best prepared to review
13 this, and thus armed, I thought it was a scholarly
14 review.

15 There are some interesting variables that are
16 hard to control.

17 I have a couple of terminology issues.

18 I want you to describe some existing guidance
19 and reports, you are really talking about some
20 background issues, and I'm not sure how it is guidance.
21 And the one other very small point is I enjoyed the
22 comment about estimates for high end consumers.

23 Maybe you want to use consumption.

24 DR. MARTY: Okay.

25 CHAIRMAN FROINES: Tony. Section 6.

1 DR. FUCALORO: What I understood, I thought it
2 was good.

3 There were some parts that I did not feel very
4 confident with assessing myself, behavioral factors and
5 that sort of thing.

6 I assume that is done well, but the other
7 stuff seemed fine to me.

8 CHAIRMAN FROINES: Craig, I think Tony just
9 finished, but I'm not sure.

10 I want you to do Section 7 and 8 and also
11 Appendix D.

12 DR. BYUS: I don't have too many questions,
13 but I do have a couple.

14 For the food, you say in the beginning that
15 you are mainly concerned with home grown vegetables and
16 home grown chickens and cows and pigs.

17 What is the rationale for that? Did I miss
18 something?

19 DR. MARTY: The rationale is we focused
20 primarily on the backyard garden scenario for people
21 living near facilities emitting air borne contaminants,
22 because they are the only people eating that produce.

23 For something that is done commercially, it is
24 shipped all over the place and mixed all over the
25 place, and it would essentially dilute the impacts on

1 the population surrounding the facility, because it is
2 shipped all over the place.

3 The concern really lies with impacts on crops
4 that are grown in the backyard, and the people who live
5 near the facility who are also eating that.

6 DR. BYUS: You mentioned it a little bit in
7 your introduction, but it was not clear.

8 DR. MARTY: So we should clear that, okay.

9 DR. BYUS: That might -- then in light of
10 that, most of these -- it was very nicely put together
11 and justified and described, and the reason you chose
12 the various studies is very nicely defended and
13 presented.

14 Are these surveys for food eating for
15 homegrown products or are they just for all products?

16 DR. MARTY: All products.

17 DR. BYUS: So, if that is the case, then I
18 think you have somewhat of a problem here, because all
19 the surveys are based on sort of total food
20 consumption, regardless of where you eat it, and yet
21 the information that you want is primarily on
22 homegrown.

23 Now, anyone who has ever had a garden, and I
24 have, and let me give you just a brief example of this.

25 I moved to a new house four months ago, and we

1 have a little orchard on the side, and it has plum
2 trees. I do not eat plums throughout the year.

3 My plum tree produced, I would guess, a
4 hundred pounds of plums. I have been eating plums for
5 the last three weeks at an unbelievable rate. I must
6 have eaten -- and the other day I woke up with
7 diarrhea, which has now limited my plum eating.

8 (Laughter.)

9 DR. BYUS: However, I eat an enormous amount
10 of plums.

11 DR. BLANC: I'm really waiting for the printed
12 transcript to circulate.

13 DR. BYUS: It's just an illustration.

14 The same goes for anyone who raises tomatoes
15 or zucchini.

16 DR. GLANTZ: Just for the record, I was
17 wondering about the effect of the plums.

18 DR. BYUS: Okay.

19 Or for zucchini, your rate for all people who
20 have homegrown stuff is extremely high in the short
21 term, and then very low the rest of the time.

22 This does not take that into consideration at
23 all.

24 DR. MARTY: A couple points, or a couple of
25 responses, the first issue is that the food consumption

1 survey is looking at the total food consumption and how
2 can we apply that to the backyard garden.

3 We actually do have in our exposure algorithm
4 a factor that says you get X percent of your total
5 produce from your garden, and that X percent we left
6 flexible so that the risk assessors can plug in the
7 number appropriate for the site.

8 We have a default in there, but we are not
9 certainly wed to that default.

10 The default comes from a 1984 EPA document
11 where they surveyed people's home gardens and came up
12 with this percentage of the total produce over a year
13 comes from the home garden. So that factor gets thrown
14 into the equation.

15 The issue of short term high consumption we
16 don't have a very good handle on, and we really don't
17 deal with in this document. The food consumption
18 surveys are generally three-day intakes.

19 If you do not eat the tomatoes that day, it is
20 not in the pile. One way to try to get around that is
21 to have a big enough survey so that you ask enough
22 people so that it ends up not making that much of a
23 difference.

24 You are right in that there is still this
25 issue of short term very high consumption. We are

1 hoping that it might be taken into account by using the
2 95th percentile distribution as the high end.

3 Some of those are pretty high. If you look at
4 them and calculate it out in grams, it's a lot.

5 You are right. It is a disconnect, and it's
6 hard to fill that gap in. We're making assumptions
7 that we're filling that gap by using a 95th percentile.

8 DR. BYUS: Okay. Otherwise I thought it was
9 very good.

10 For water, the only comment that I would
11 have -- I mean you do go into quite a bit of concern
12 about whether the water consumption values are
13 appropriate for California and rightfully so, and you
14 go into quite an analysis of that. Basically you are
15 saying that adults ingest one to two liters of water
16 per day, roughly.

17 Having also -- again drawing from my personal
18 experience, I used to live in Arizona, in Tucson, which
19 had a relative humidity of about four to seven percent
20 most of the winter, and I can tell you that I consumed
21 a lot more than two liters of water a day.

22 In fact, most people that live in the desert,
23 where humidity is low, consume probably double that
24 much easily. That is not, I did not see that accounted
25 for here.

1 It is a difficult thing to do, to actually
2 come up with a number, but I would imagine that the
3 water consumption is twice as high for people living in
4 Palm Springs or anywhere out in the desert.

5 DR. MARTY: That is exactly the reason why we
6 are not comfortable using just an average consumption
7 in our risk estimates, and that is why we are trying to
8 account for a high end consumer by asking people to
9 also look at the 95th percentile.

10 The data that we end up using is the Western
11 Regional data from the NFCS.

12 DR. BLAISDELL: National Food Consumption
13 Survey from '77-'78.

14 DR. MARTY: Thank you. In there they separate
15 out total water and tap water.

16 Looking at liters per kilogram for the tap
17 water, you are pretty high if you are looking at the
18 95th percentile. It is 53 milliliters per kilogram
19 body weight per day.

20 DR. BYUS: Three and one-half liters is not
21 bad.

22 I just wonder if in the desert, if you do not
23 shift the whole distribution. You probably do, but
24 maybe not to some maximal level.

25 DR. MARTY: The example we always think about

1 is these guys working in the fields in the Central
2 Valley, they must consume 10 liters a day.

3 So we realize that there are going to be
4 people above the 95th percentile in the distribution,
5 and we are not looking at them with this methodology,
6 except for if you do a Stochastic analysis, then you
7 include the entire distribution, then you are going to
8 see risk estimates above that 95th percentile.

9 DR. BYUS: Is there any physiological
10 measurements done on the calories expended in various
11 relative humidities and how much water -- I mean could
12 you make some kind of a physiological adjustment?

13 I don't know, because I don't know that
14 answer, but it seems to me that someone must have done
15 it at some point.

16 DR. MARTY: About the only thing -- I'm sure
17 that's been done.

18 DR. GLANTZ: That actually is a good point
19 that we ought to try to integrate it into the document,
20 given the number of people in California in desert
21 climates, and the fact that some of the sources are in
22 those remote area.

23 I think that is an important point that we
24 probably ought to add, to the extent that you can.

25 DR. MARTY: What we can do is note that in the

1 document, and also we end up having to review the risk
2 assessments that are done. If we get a risk assessment
3 from a facility in the Mojave Desert and they have not
4 really looked at water impacts, to high end consumers
5 we can make that comment.

6 DR. GLANTZ: I do not want to hold things up
7 over just one point, and I think that which you just
8 said is fine, Melanie, but I think if you can find some
9 data I think it would be worth adding that as a
10 subsection dealing specifically with this issue.

11 Just as you have summarized the wide variety
12 of data that's available for other aspects of the
13 study, I think if you could find something to actually
14 integrate into the report to deal with the issues that
15 Craig is raising, you should.

16 Unless people disagree, I do not think that it
17 has to come back to the Panel, I think if it went to me
18 and Gary, and if John is willing to have us do that, we
19 could just check it over.

20 I think you should do more if you can than
21 just mention it, because, as a practical matter, these
22 people in the field are going to be taking this
23 document to actually do the risk assessment.

24 So, it's really not fair to them to not
25 include it, and then when they send the risk assessment

1 in to say why didn't you include that. I think we
2 ought to try to do that before the thing is finalized.

3 CHAIRMAN FROINES: There is also the
4 chicken-egg question, isn't there?

5 Because when you define people who have to do
6 risk assessments that kind of issue should be
7 considered in defining who are actually requested to do
8 the risk assessments, rather than seeing if they deal
9 with it when they would -- because if you are in
10 Bakersfield and you have somebody who is trying to
11 decide whether or not to do a risk assessment, and
12 people in the neighborhood are drinking 10 liters of
13 water a day, then you may want to say they should do a
14 risk assessment because the risk is proportionately
15 greater.

16 DR. MARTY: There is another issue.

17 The way the water model works, there are not
18 very many facilities that actually impact a drinking
19 water source, since a lot of the drinking water is from
20 groundwater, and we're not looking at groundwater
21 impact.

22 So this probably in the overview of things is
23 not going to make a lot of difference to very many
24 facilities, but we will see what we can find.

25 DR. BYUS: I think you should just put a

1 paragraph in there about geographic distribution.

2 DR. GLANTZ: If there is any data, it would be
3 worth --

4 DR. BYUS: I'm sure the military has data on
5 this. I'm sure it has military documents somewhere
6 calculated this out completely in terms of calories
7 consumption and exercise and varying humidities and
8 requirements for water as you change humidity, and then
9 as you add calorie expenditures per hour, how much more
10 water to stay hydrated.

11 I'm sure it's all somewhere. You could make a
12 calculation and make some rough assumption of how to
13 shift the distribution, within reason.

14 DR. BLAISDELL: This is Bob Blaisdell, from
15 OEHHA.

16 There may not be enough data to generate a
17 distribution, but there is probably some data somewhere
18 from the military that will enable us to estimate water
19 requirements in the desert.

20 DR. BYUS: Okay.

21 CHAIRMAN FROINES: You are right. It may not
22 be a major issue.

23 DR. BLAISDELL: I think there's only been one
24 or two risk assessments where this pathway has been
25 used.

1 DR. FUCALORO: You know, I left this home and
2 I'm trying to reproduce some of this stuff, so if I go
3 back to Chapter 6, is that a problem?

4 One of the things that I noted was the
5 definition of C, Sub soil, on page 2 is different
6 than --

7 CHAIRMAN FROINES: Wait a minute.
8 Is Craig finished?

9 DR. BYUS: I have to do Appendix D.

10 DR. FUCALORO: Oh, I'm sorry.

11 DR. BYUS: I suggest that everyone read
12 Appendix D to see how many ways you can cook chicken.

13 (Laughter.)

14 DR. BYUS: I was damned if I wasn't going to
15 find another way to cook chicken. As far as I'm
16 concerned, the only thing that is missing is the
17 chicken giblets.

18 That is on page D 15. There are four pages of
19 how to cook a chicken, but that does not include the
20 chicken giblets.

21 DR. FUCALORO: I did not notice Chicken
22 Cacciatore, did you?

23 (Laughter.)

24 CHAIRMAN FROINES: Can I go back to your water
25 chapter before, I think he is finished.

1 DR. BYUS: I'm finished.

2 CHAIRMAN FROINES: Are you going to prepare a
3 summary document, an executive summary that really is
4 very frugal in terms of the way that it presents the
5 ultimate findings?

6 DR. MARTY: Yes.

7 CHAIRMAN FROINES: Because, I don't have any
8 technical problem with the water chapter, but I think
9 that the last, 841, under 841 recommendations, there is
10 a lot of words in there, and I think that if -- you
11 need a document where anybody who wants to understand
12 what are the ultimate conclusions can go to them and
13 just read what they are.

14 This is just -- and I could have picked other
15 chapters to make the comment on. The document is so
16 voluminous that only those who are absolutely forced
17 for whatever reason to read it, are ever going to.

18 It is not -- you know, it is a good document
19 for insomnia but it's not necessarily a good document
20 for more than that.

21 DR. GLANTZ: I did not think of this document
22 as bed time reading, but I thought of it more as a
23 reference book.

24 CHAIRMAN FROINES: No, I understand. What I'm
25 saying is I think it would be useful to have an

1 executive summary that really did focus the principal
2 approaches from each chapter and state what the issues
3 are at the outset.

4 DR. GLANTZ: I think that is a good idea. I
5 approached this thing sort of like editing an
6 encyclopedia.

7 It's like if you're dealing with a certain
8 part of the problem you can look in the right chapter
9 and look up the information you need. So I didn't
10 really see this as something one would read cover to
11 cover.

12 Then, having said that, I think a good
13 introduction that sort of puts the whole thing in
14 context would make the document easier to use.

15 CHAIRMAN FROINES: I have another reason for
16 saying that, that I wasn't necessarily going to bring
17 up here, but that at some point there needs to be a
18 state effort to make policy decisions on how one uses
19 stochastic modeling for risk management purposes and
20 for ultimately defining risk in the policy context.

21 So, there will be people outside of this
22 technical world who will have some interest in it,
23 because the scientific document doesn't deal with the
24 ultimate decision making issues.

25 So, having an executive document, and I hate

1 to make this kind of recommendation because people are
2 already wiped out from all the effort this has taken,
3 but it seems to me that there needs to be some way that
4 somebody who is in the Legislature or industry or an
5 environmental group, or what have you, can understand
6 something about what this is all about, because
7 presumably at some point, decisions will be made with
8 respect to its use.

9 DR. MARTY: There is a manual that is coming
10 that basically distills out the four technical support
11 documents, but it's more of a guidance manual for
12 consultants in Air Districts using or doing Hot Spots
13 Risk Assessments.

14 It's not quite the same thing as an executive
15 summary, for this document.

16 We could write an executive summary.

17 DR. GLANTZ: Yeah, I think you want it to be
18 under ten pages long.

19 CHAIRMAN FROINES: Why don't we talk about it
20 separately, we don't need to take up time here.

21 I don't think anyone is going to object if
22 Stan, you and I sat down and talked about it
23 separately.

24 DR. FUCALORO: I have a question.

25 I'm trying to recreate this stuff.

1 CHAIRMAN FROINES: We're finished on this, so
2 we're going back to 6?

3 DR. FUCALORO: If you don't mind.

4 CHAIRMAN FROINES: No, absolutely.

5 DR. FUCALORO: Page 6.2, I could be wrong, but
6 I think the factor in the equation dermal dose, I did
7 it back home and I seem to be able to reproduce it
8 here, that should be 10 to the ninth, not 10 to the
9 minus ninth.

10 But just check on that.

11 DR. MARTY: Okay.

12 DR. FUCALORO: On page 6.10 use a different C
13 soil unit. I don't know if that is a problem, but if
14 you use the -- in one case you have milligrams and
15 kilograms and the other you have micrograms and
16 kilograms, and I do not know if you want to get those
17 together.

18 Then the other thing that I am able to
19 reproduce, just by looking at it I can tell, and I did
20 this math back home. Equation 6.3 on page 6.3, I would
21 never want to do this, your exponential is to the
22 natural number, and you have a soil elimination
23 constant which is $.693$ over T one-half, and $.693$ is the
24 natural log of 2, and there was the one over e life is
25 really what you're looking at instead of the one over

1 half life.

2 It is a rather awkward way I would say, to do
3 this. I think a person who has some mathematical
4 knowledge --

5 DR. GLANTZ: It's what they do in medical
6 schools all the time.

7 DR. FUCALORO: I do not want a doctor to touch
8 me then.

9 Do not give me a dirty look.

10 DR. GLANTZ: It's a little bit backwards but
11 that is how they do it.

12 DR. FUCALORO: You are using a half life,
13 versus one over an e life, which is a natural lifetime.

14 DR. GLANTZ: You are absolutely correct, and
15 they should leave it the way it is.

16 DR. FUCALORO: The expert, I do not think it
17 is wrong it is just awkward.

18 DR. GLANTZ: It is a little convoluted. If
19 you wanted to say, you could say this might make him
20 feel somewhat less -- instead of saying soil
21 elimination constant, you could say soil elimination
22 time constant.

23 Then maybe what you could say in parentheses
24 is to say equal to $.69$, or $.693$ over the soil
25 elimination half life.

1 DR. FUCALORO: That being the natural life.

2 DR. GLANTZ: Does that approve --

3 DR. FUCALORO: It is okay.

4 CHAIRMAN FROINES: We have a long way to go
5 and a short period of time to do it, so let's move
6 ahead.

7 DR. GLANTZ: The problem is that people talk
8 about half lives.

9 CHAIRMAN FROINES: Okay.

10 DR. ATKINSON: Page E 3, the younger equation
11 on the top, the P saturated is in fact the liquid phase
12 vapor pressure for chemicals.

13 Further work has been done by Panco and
14 Vitelman, and I can give you the references, show that
15 that vapor pressure is the liquid phase vapor pressure
16 or the sub-cooled liquid vapor pressure. So it can be
17 quite different from the saturated soil phase, which
18 means things will be much more in the gas phase than
19 you would otherwise calculate.

20 You need to change that because it can make a
21 huge difference, and I could send you the other
22 references, Panco in Atmospheric Environment in 1987,
23 and 94, and Vitelman in 1998.

24 But that should be changed.

25 Also on the next page, on page E5, all those

1 vapor pressures do look sort of strange. They are
2 inconsistent in fact with the next document we are
3 going to be looking at, which is those various
4 chemicals.

5 The Cresols for example, are quite different
6 than what you've got in the other document.

7 But anyway, a minor thing.

8 I've also got some comments on Chapter 2. It
9 looks a comprehensive and really nice discussion, but
10 for non reactive emissions. There is no mention of the
11 impact of atmospheric reactions, which would of course
12 decrease the concentrations.

13 So in this way it would be a conservative way
14 of doing it, of treating them as non reactive.

15 But I think it would be good to have some kind
16 of comment or statement that that is not taken into
17 account in this.

18 DR. MARTY: Okay.

19 DR. ATKINSON: There's no mention anywhere in
20 it I found on Wet Deposition, which will decrease the
21 ambient concentration significantly for certain types
22 of chemicals, i.e., the water soluble ones. Conversely
23 that will increase the amounts deposited to the ground.

24 The dry deposition that I found that is not
25 mentioned, well is only mentioned in one place, seems

1 to have very high deposition rates. The mention of two
2 to five centimeter per second is enormous and that is
3 probably only approached by something like nitric acid
4 or SO₂.

5 And most chemicals, most gas phase chemicals
6 will be significantly less than that, and there is no
7 mention of Dry Deposition for particle phase chemicals
8 and the dependence on particle size. It probably
9 doesn't need very much, but a paragraph or so might be
10 useful, and I could help out in any way that you want.

11 DR. BLAISDELL: We would appreciate that.

12 DR. MARTY: Okay.

13 DR. ATKINSON: But otherwise it was a very
14 nice looking chapter and quite comprehensive.

15 CHAIRMAN FROINES: So, we are finished.

16 We can entertain a motion to -- go ahead.

17 DR. GLANTZ: I would like to move that the SRP
18 accept this document, subject to the editorial points
19 and points of clarification discussed here, and that
20 those can be reviewed by me and Gary Friedman and the
21 Chair, but wouldn't need to come back to the Panel.

22 CHAIRMAN FROINES: Tony, I'm sorry, but were
23 you a lead on this document?

24 DR. FUCALORO: No.

25 DR. GLANTZ: No, was it me and Gary Freidman

1 or just me?

2 CHAIRMAN FROINES: Just you, I think.

3 DR. GLANTZ: Okay.

4 Then I would like to amend my motion to say
5 that I will work with the staff, or I would like to
6 rescind the motion and make a different motion.

7 I would like to move that the Panel
8 tentatively accept and approve this document subject to
9 me working with the Staff on these points of
10 clarification, and then with final approval by the
11 Chair, and that the report would not need to come back
12 to the Panel.

13 CHAIRMAN FROINES: Then you want to not
14 tentatively approve it, you want to approve it with
15 that provided --

16 DR. GLANTZ: Subject to.

17 CHAIRMAN FROINES: Subject to.

18 DR. GLANTZ: Yes. I don't think that it needs
19 to be tentative.

20 I think that the issues that I found, the
21 issues other people raised were all really almost
22 editorial.

23 DR. BLANC: I second the document be approved,
24 subject to minor modifications as delineated in the
25 record.

1 DR. FUCALORO: To the extent I understand it,
2 I'm going to vote for it.

3 DR. GLANTZ: Don't joke about things like
4 that.

5 (Laughter.)

6 DR. GLANTZ: That was a joke, for the record.

7 DR. BYUS: I did eat all of those plums.

8 CHAIRMAN FROINES: Wait, wait, wait, we want
9 to move ahead here.

10 Is there any further discussion?

11 Gentlemen, is there further discussion?

12 Hearing none, let's take a vote.

13 All in favor, aye.

14 (Ayes.)

15 CHAIRMAN FROINES: Let the record show that
16 the vote was unanimous.

17 Do you want to take a break for ten minutes?

18 DR. GLANTZ: This document has had a fairly
19 rocky gestation period because of politics largely, but
20 I think that the end result, this is one of the most
21 impressive things I think that OEHHA has done among a
22 long list of pretty impressive documents.

23 So, I think you guys should really be proud of
24 yourselves for this.

25 DR. MARTY: Thank you.

1 CHAIRMAN FROINES: Okay. We're taking a ten-
2 minute break.

3 We'll start again about 3:00, sharp.

4 (Thereupon a brief recess was taken.)

5 CHAIRMAN FROINES: We have a quorum.

6 What are we going to do, Melanie, because I am
7 worried about Paul leaving, and so I would rather we
8 got to our discussion faster than listening for a long
9 time.

10 DR. MARTY: We have seven slides.

11 DR. SALMON: We have seven slides.

12 I will shoot through them as fast as possible,
13 starting right now, if that's all right with you.

14 This is a further round of chronic reference
15 exposure levels for the Hot Spots Program.

16 Next slide, please.

17 You have seen this definition here, and the
18 point is that this is designed to be a protective level
19 at which most people would not find adverse health
20 impacts.

21 The next slide, please.

22 The list of chemicals is two pages of this,
23 but here they are, this one and the next one.

24 The ones I really want you to see are coming
25 up next.

1 The major changes which we've made since the
2 version that you saw previously of the chemicals
3 reflects public comments and reflects specific comments
4 from the Panel. They also reflect the generic comments
5 on methodology and formatted presentation, which the
6 Panel made in respect to our earlier rounds of
7 presenting the RELs.

8 The ones here which were extensively rewritten
9 are the REL on arsenic, which involved a greatly
10 increased summary of the literature.

11 For Chromium VI, the new version, we offered
12 two RELs for different speciation in Chromium VI. Two
13 in particular, we applied the benchmark dose
14 methodology following the guidelines in the Part III
15 Technical Support Document, and these were new
16 calculations that we did for this version.

17 Next slide, please.

18 Then the other chemicals, we've added
19 supporting studies, comparison RELs, re-evaluated the
20 USEPA RfCs to ensure they conform with our Technical
21 Support Document methodology. And these in fact are
22 the changes that resulted for the four USEPA RfCs, for
23 acrolein, chlorine dioxide, dimethylformamide and MDI.

24 None of the changes are huge, but they
25 represent an adjustment so that these values now follow

1 our recommended methodology.

2 Finally, just to remind you of the next steps
3 for further chronic RELs, we have to review public
4 comments on what I call batch 2 B, which is the further
5 20 chemicals which have already been through the public
6 notice period and have had a preliminary presentation
7 some time ago to the Panel.

8 We have to incorporate the changes in response
9 to those comments, public and Panel comments, and then
10 these will be sent to the Panel for review and
11 discussed at a future meeting.

12 The other thing that we have to do is to
13 present the third batch of RELs, which will probably be
14 another approximately 40 chemicals for their second
15 public comment period.

16 We hope to do that sometime in the next few
17 months also.

18 Thank you.

19 CHAIRMAN FROINES: Sorry to rush you.

20 I have couple of general questions but I will
21 save them for later.

22 Why don't we go directly to the -- I just have
23 one quick question before Paul starts.

24 I learned just a day or so ago that Peter was
25 not going to be here, have you had input from Peter on

1 the three chemicals that he's assigned?

2 DR. MARTY: No.

3 DR. SALMON: No. We received some comments
4 from Dr. Fucaloro and Dr. Friedman, which we have
5 incorporated at this point.

6 We have not received any others at this point.

7 CHAIRMAN FROINES: Let's start with Paul.

8 DR. BLANC: Okay. The first chemical on my
9 list is acrolein.

10 I have a few comments here.

11 I think it's not clear from Section 3, Major
12 Uses Resources, how important this chemical is as a
13 byproduct of structural and even wildland fires.

14 In fact, a major source of human exposure is
15 as a combustion byproduct, and I don't think that comes
16 through here at all.

17 And similarly, under the effects of human
18 exposure that is all the more so true where there
19 probably aren't good chronic exposure data in humans,
20 but there's a whole lot of acute exposure data. And
21 even though they may not be applicable to the body of
22 this text, it makes it sound like this is some kind of
23 very exotic rare chemical.

24 DR. COLLINS: You do recall we have an acute
25 REL?

1 DR. BLANC: No, I know, and I think that it is
2 enough to refer people to say that there is an abundant
3 acute exposure of literature.

4 Although I do wonder whether any of the
5 firefighter lung function literature is relevant, even
6 though they are exposed to a myriad of products.

7 Again, you might just want to say that
8 although firefighters are chronically exposed to this,
9 they are exposed to a mix, and it's not possible to
10 analyze those data.

11 DR. SALMON: I think that it is a very
12 material point, although obviously, as you said, it
13 would be hard to actually use that in developing the
14 REL.

15 DR. BLANC: Right, but by not mentioning it --
16 it is something that you know so well, but somebody
17 reading this will miss the point, I think, unless it's
18 said explicitly.

19 That being said, I was not clear here why it
20 was that the monkey study was not used. It was not
21 explicitly stated why in the end the study that was
22 used was the rat study.

23 DR. COLLINS: I do not recall specifically, we
24 were going along with EPA using the same study, and I
25 do not know who went through the mental gymnastics of

1 not using the monkey.

2 How about Dave, do you have any idea?

3 DR. BLANC: Could you relook at that, because
4 just looking at it on the face of that, the monkeys
5 will obviously be a better model if you have it.

6 They seem to have a LOAEL at .22. I was not
7 sure, I did not pull the studies to read them, but the
8 way that the document reads -- if there was a good
9 rationale for not using the studies, it might be good
10 to say that explicitly, because reading it, I could not
11 tell why.

12 CHAIRMAN FROINES: You mean the dogs?

13 DR. BLANC: There is a dog and monkey study.

14 By the way, there is a typo on page A 3, the
15 last paragraph, there is a space between two and
16 monkeys.

17 Anyway, it is true because the effect that was
18 seen in the bronchiolitis, for example, is really the
19 effect you would be worried about in humans.

20 One question because it comes up later, just
21 remind me again, I think I remember the discussion
22 about why the factor for three was used in certain
23 cases going from LOAEL to NOAEL, but I can't remember
24 why the factor for three in some cases is used for the
25 inter species instead of the 10 that we usually use.

1 DR. COLLINS: Because the RGDR calculation was
2 not the first -- the RGDR calculation, if that was done
3 and the judgment was made, then the inter species
4 factor was reduced to 3 because it was felt that the
5 adjustment made up for some of the inter species
6 difference, the difference in the anatomy of the
7 airways between the two species.

8 DR. BLANC: RGDR --

9 DR. SALMON: Regional Gas Deposition Ratio.

10 And essentially what we're saying is the
11 10-fold inter species factor is conventionally regarded
12 as having 2, 3 or 3.16 value parts, one of which is
13 seen as the toxic kinetic adjustment, and one which is
14 seen as the toxic dynamic adjustment, and the RGDR
15 calculation is seen as at least a simplified form of
16 Pharmacokinetic calculation, which replaces the
17 otherwise default used in the three-fold factor, which
18 is half of the inter species connection.

19 DR. BLANC: And would that matter if you
20 thought the target organ for toxicity were the lung
21 versus a systemic factor?

22 DR. SALMON: Well the RGDR calculation varies
23 according to whether the target is in the respiratory
24 system, in the extrathoracic region, or actually in the
25 lung or for a systemically active toxicant.

1 DR. BLANC: So because your critical effect
2 here was in the upper airways in the rats, there would
3 be a different inter species calculation if you thought
4 it was lower airways?

5 DR. SALMON: Yes. That is noted in the
6 narrative, in the Table in the beginning of Section 6.

7 In the Table beginning at Section 6, we note
8 that this is treated as a gas with extrathoracic
9 respiratory effects, in other words, the upper airway.

10 DR. BLANC: The upper airway.

11 Well, that is all the more reason I think to
12 take a good look at the dog and monkey --

13 DR. SALMON: I will certainly look at it.

14 One of the problems with the studies in larger
15 animals is often the statistical quality, and reporting
16 is poor with those type of studies.

17 DR. BLANC: Because there are fewer subjects.

18 DR. SALMON: Fewer subjects and also in some
19 cases there is willingness to actually do extensive
20 histology in some studies.

21 But we will look at it and see if we can use
22 it.

23 DR. BLANC: Good, because I don't think that
24 the rat studies were very big either in number.

25 CHAIRMAN FROINES: While Paul is looking for

1 his next chemical, I did a literature search on
2 acrolein, because I think acrolein is an extremely
3 important compound.

4 In fact, I suspect that your REL is lower than
5 the ambient levels in Southern California, and at some
6 point I would like to know what the implications of
7 that are, because I think acrolein represents a very
8 more major toxic air contaminant.

9 I do not know about the half life, and Roger
10 may know something about that, but it is a very toxic
11 compound. Between 1998 and 2000, I got 55 references.
12 So, your document was a little old in terms of the
13 references.

14 Now, whether these are particularly relevant,
15 I don't know.

16 DR. SALMON: We did search specifically for
17 health effect studies, and I am aware of a number of
18 measurement studies.

19 You are right that the REL we are proposing is
20 certainly comparable to levels which you reported as
21 ambient levels.

22 There is not much we can do about that, except
23 if anybody happens to have a study which we could use
24 to derive a human NOAEL or LOAEL, for instance, then
25 obviously that would be very helpful, but at this point

1 we haven't identified any study.

2 If the Panel knows of them, we would be very
3 pleased to hear about it.

4 CHAIRMAN FROINES: I will also send you the
5 data that we have recently collected on acrolein levels
6 so that you have them.

7 I do not think that the ARB is collecting data
8 on acroleins. So, it is a problem in Southern
9 California in terms of what we know about its
10 existence, and that is true for a lot of carbonase.

11 DR. SALMON: I would be very interested to
12 hear about those.

13 DR. BLANC: So, my next chemical is
14 Dimethylformamide, and I thought the effects of human
15 exposure section was a bit too sparse, and in
16 particular I thought there was a study that did have
17 relevant data for your comparison, which I've made a
18 copy for you which is from 1991 by Wong, et al, which
19 is "Dimethylformamide Induced Liver Damage Among
20 Synthetic Leather Workers."

21 I do think also you need to comment on the
22 Redlich study in the body of the section on human
23 exposure, even though that study can't be used for your
24 purposes because they didn't have exposure levels.

25 You only cited in terms of where you can get

1 exposure, but that was a very well-documented study
2 that showed how important a problem this is, they just
3 didn't have the air borne exposure levels.

4 Since that was the most important outbreak
5 study in the United States, whereas this other one does
6 have sort of exposure levels. I mean my general take
7 was that your number here is very conservative, so I
8 didn't think you missed the boat or something.

9 DR. SALMON: But we need the extra --

10 DR. BLANC: Next one I have is ethylene oxide,
11 and here is one in which I categorically don't think
12 you can use the study you use to derive the levels, so
13 you're going to have to redo this one.

14 DR. COLLINS: What?

15 DR. BLANC: You can't use the study that you
16 used. I don't believe that it is appropriate to use
17 the study that you used.

18 I have major problems with it.

19 Not simply the study, which was very small,
20 but the interpretation, given the methods that were
21 used.

22 DR. COLLINS: Can we use the animal study
23 which basically ended up at the same level?

24 DR. BLANC: Yes, I have less problem with
25 that.

1 For one thing, and one thing that you need to,
2 aside from the editorial changes that would drive I
3 suppose -- you say that the reason that you use it, was
4 you say that "the exposed subjects were significantly
5 more frequently classified as impaired 5 out of 12,
6 compared to controls 1 out of 16 chi square equals
7 6.0861 less than .05."

8 That is on page A 120, second paragraph.

9 I don't know if you are citing that from the
10 paper itself, but I did the calculation. First of all
11 it should be Fisher's Exact Test that it made me
12 suspicious right there and the Fisher's Exact Test 2 lp
13 is .057, so it's -- one wouldn't reject the hypothesis.

14 The way they did this is they probably did
15 25 -- I know this group so I know how they work. They
16 did 25 different neuropsychiatric tests and then called
17 some people abnormal and then others not based on the
18 number. So there's already a multiple testing issue on
19 all of the methods used by that group.

20 So, I just wouldn't use their work.

21 And another fundamental thing is that they are
22 assuming that the levels of ethylene oxide that they
23 measured at one point in time, represented the chronic
24 exposure level, when one would assume that the chronic
25 exposure that they have is probably higher in the past.

1 DR. SALMON: Would you regard the human data
2 as providing any significant support to the animal --

3 DR. BLANC: No, because you are not doing
4 neuropsychiatric, so, I wouldn't use that study as
5 supporting anything. I just think it undermined your
6 argument.

7 Then the last one I was supposed to do was
8 toluene diisocyanate.

9 One small technical question, all of the
10 physical properties, they use sight, is that for a
11 50/50 mix?

12 DR. COLLINS: No. That's mainly, Dr. Fucaloro
13 pointed that out, too. It's mainly for 2,4 TDI,
14 although the melting point is 20.5 for 2,4 and for the
15 2,6, I think it's 18.3.

16 It is not much different but those are mainly
17 for 2,4 TDI.

18 I will also make a note.

19 DR. BLANC: In terms of major uses and
20 sources, you emphasize appropriately polyurethane foam,
21 but there are other coatings, certainly urethan
22 coatings, that are not foams, where this is used. I
23 grant you that much of that has been replaced by HDI
24 and MDI, so I would certainly make that clear.

25 ///

1 DR. SALMON: I think we mentioned floor and
2 wood finishes. We will add some extra ones, or would
3 you prefer us to just refer to --

4 DR. BLANC: It just says emissions. It says
5 it's used in these other things, and then it says
6 "Emissions of TDI to the atmosphere can occur during
7 the production, handling and processing of polyurethane
8 foam."

9 CHAIRMAN FROINES: What do you know about half
10 life of TDI?

11 DR. ATKINSON: It's fairly reactive. There is
12 only one study that has ever been done.

13 DR. BLANC: I also was very confused by a
14 sentence here in the section on the effects of animal
15 exposures. It's the second paragraph of that section.

16 "No antibody response or dermal sensitivity
17 developed in the animals exposed to 0.02 parts per
18 million TDI in the long protocol, although antibody
19 target was high."

20 I suppose you mean although the antibody
21 target was high.

22 What do you mean that there was "no antibody
23 response but the antibody target was high?"

24 DR. SALMON: I think it is implying that all
25 the levels were high, but there was not a statistically

1 significant difference between the exposed -- and
2 control is, I think, what was intended.

3 DR. MARTY: We will go back and look at the
4 study.

5 DR. SALMON: We can clarify.

6 DR. BLANC: But the controls should not have
7 any antibodies to TDI at all. It's not something you
8 have natural antibodies to.

9 Would you clarify that?

10 DR. SALMON: We will clarify that based on the
11 original paper.

12 DR. BLANC: That was mine. I did not have a
13 problem with the chronic reference exposure level piece
14 of it.

15 So, in summary then of the four, ethylene
16 oxide is the one I think you have to use a different
17 basis.

18 Methylene chloride, you need to include the
19 other exposure, human exposure data, although -- I'm
20 sorry, I mean dimethylformamide, although I think the
21 one you chose is going to be the most conservative.

22 I think that you are probably going to be
23 stuck with acrolein, because I don't think you're going
24 to find better or chronic animal exposure data other
25 than the one's you have, but that is another one where

1 I think you may wish to use either the dog or monkey,
2 or say what your value would have come out to be had
3 you done so.

4 In the TDI, the minor changes.

5 That concludes my comments.

6 CHAIRMAN FROINES: Craig.

7 DR. BYUS: I do not have a lot to say.

8 I did read them all, and I think they were all
9 pretty good, to my limited knowledge of toxicology in
10 chemicals.

11 For Cresol in A 79, you say inhalation of
12 reference exposure level 600 micrograms per liter. It
13 was just confusing to me which studies you actually
14 used to make your calculations.

15 Sometimes it was clear and sometimes it was
16 not clear.

17 Do you know what I mean?

18 So in other words, you use table -- I mean
19 section 6 to make the calculations that you show in the
20 front?

21 DR. COLLINS: Yes.

22 DR. BYUS: Okay. So for the Cresol, you used
23 all the EPA studies to make the calculations?

24 The full document -- some of the other ones
25 you've made a little clearer.

1 DR. COLLINS: I think that they had both the
2 LOAEL and the NOAEL for both were the same, and I have
3 some of the key studies here, if you want the specific
4 data, but basically I found that was the NOAEL and
5 LOAEL, and the weight is the same so you just do the
6 same for jumping off.

7 That would be my explanation.

8 DR. SALMON: I think we might be able to
9 improve the way it is cited in the table.

10 DR. BYUS: Which study did you use?

11 DR. SALMON: Which study did we get the LOAEL
12 and NOAEL from.

13 I think we can clarify that from the sources,
14 because that will involve reading a fairly large stack
15 of papers, but we can do that.

16 DR. BYUS: Also I like your data strength and
17 limitations for Cresol, and that is all I have for that
18 one.

19 Ethylene dichloride, I think I had -- again, I
20 think we made it clear which study -- yes, you used the
21 single study in this case, which I thought was
22 reasonable, and again, I have no question about
23 hydrazine either.

24 They seemed fine to me.

25 CHAIRMAN FROINES: I don't understand

1 something. I did not look at this enough, so I readily
2 admit to that.

3 Is this basically an EPA --

4 DR. MARTY: Which chemical?

5 CHAIRMAN FROINES: Cresol.

6 DR. COLLINS: Basically it was a somewhat
7 reworking of their RfD into an RfC.

8 It's like one difference in the LOAEL -- no,
9 I'm sorry, we use a three-month study. We consider
10 that subchronic and use a UF of 3, they used a UF of
11 10. That is their default policy.

12 That is the main difference. And then there
13 were some early Russian studies, not that early, but
14 they were such that it was very hard to figure out what
15 they had actually done. We were roundly criticized for
16 using them, so we went to the RfD which seemed like a
17 more reasonable basis with more reasonable end points,
18 liver effects and so on.

19 This one is a problem.

20 DR. MARTY: The route to route extrapolation.

21 CHAIRMAN FROINES: You had no comments on
22 ethylene dichloride?

23 DR. BYUS: Just in terms of clarification on
24 the studies.

25 CHAIRMAN FROINES: Okay.

1 DR. GLANTZ: Well, I unfortunately ran off and
2 grabbed the wrong document this morning.

3 I have a few detailed comments but they are
4 non substantive, which I can pass on to the staff.

5 There was one other thing that I thought you
6 might want to look at in terms of 1,3 Butadiene, and
7 that is, there have been some interesting studies done
8 in cockerels, looking at 1,3 Butadiene as being
9 atherogenic, causing atherosclerosis.

10 They were actually done in the context of
11 trying to identify what it was in second hand smoke
12 that caused atherosclerosis, but they're by a guy named
13 Arthur Penn, P-e-n-n.

14 And that's the one thing I can remember. I
15 thought the document, again to my limited toxicology
16 knowledge, it was fine. There were a couple little
17 points I can't remember about Arsenic, which I can pass
18 on.

19 I didn't find anything in there where I
20 thought there were major difficulties. I apologize, I
21 grabbed the old REL document when I came in today.

22 But that would be my only one suggestion.

23 DR. BLANC: Can we go back to hydrazine for a
24 minute?

25 DR. GLANTZ: I presume that I could pass

1 through a few other little comments on to staff. I'll
2 send it to you, John.

3 DR. BLANC: Hydrazine in humans acutely is a
4 well-established hepatotoxin, which is kind of lost in
5 the human review and I would assume it would be a
6 chronic exposure basis also. And I wonder whether you
7 want to make any comments on the literature with
8 related compound unsymmetric methylhydrazine, which is
9 presumed to work the same way and have the same effect.

10 And also in terms of hydrazine containing
11 toxic mushrooms. Those aren't amanita phalloides, but
12 false morels.

13 Gyromitra.

14 These are mostly acute -- again, this sounds
15 parallel to the other discussion with the acrolein,
16 where most of the data relates to cube exposure.

17 DR. SALMON: I think in those cases, most of
18 the data which are out there are acute oral data. I
19 agree it is a possibility that such effects might occur
20 after inhalation, of chronic inhalation in hydrazines,
21 but we don't have any data to allow us to use that as
22 an end point.

23 DR. BLANC: No, I just think in your
24 background you need to -- I think it is lost in here
25 that this is a human hepatotoxin.

1 DR. SALMON: We should put in the comment that
2 it is an acute hepatotoxin effect.

3 DR. BLANC: And just double check that there
4 is nothing more recent in the literature. This wasn't
5 my chemical so I didn't check it.

6 But it has been sort of a smoldering issue.

7 DR. SALMON: We have rerun -- the search is on
8 always.

9 DR. BLANC: Did you look at just Air Force
10 based literature, too?

11 The reason why I ask is, you know hydrazine is
12 the emergency fuel in F 15, 16 fighters. So people who
13 do maintenance on F 16 fighters, I don't know how much
14 gets released that way. I guess it wouldn't be in the
15 toxic inventory.

16 DR. SALMON: Well, there is a tendency for us
17 not to know the details of that kind of operation,
18 unfortunately.

19 DR. COLLINS: The key study was originated by
20 some people in the Air Force, I think at Irvine or
21 something.

22 DR. BLANC: It is used as a rocket propellant,
23 but the purer hydrazine is used.

24 And I think it is also thought to perhaps be
25 why isoniazid, one of the mechanisms of isoniazid

1 toxicity isn't metabolized to hydrazine, or have I got
2 that wrong?

3 I synthesized from it for one thing, but I
4 think it's then metabolized to it. I'm not positive
5 about that.

6 CHAIRMAN FROINES: I don't think there is a
7 lot of UDMH.

8 It's unsymmetrical dimethyl hydrazine and I
9 don't think there is much used at all in California
10 anymore. If it were, I would sure like to know.

11 DR. ATKINSON: It's formed from one of the
12 atmospheric reactions of dimethylnitrosamine.

13 CHAIRMAN FROINES: But it also forms
14 Dimethylnitrosamine --

15 DR. ATKINSON: That's right, I have it the
16 other way around. Yes.

17 DR. SALMON: It's also a metabolite.

18 CHAIRMAN FROINES: It raises a question.

19 We have a lot of carcinogens on this list.

20 DR. BLANC: They are dealt with elsewhere.

21 CHAIRMAN FROINES: Let me just ask a question.

22 When you establish an REL, do you also then
23 compare it to a value of the carcinogenic potency at a
24 particular protective level?

25 DR. SALMON: We do not modify the chronic or

1 acute RELs for non-cancer effects in light of the
2 carcinogenicity, no.

3 DR. MARTY: We look at it as a curiosity.

4 DR. SALMON: We look at it as a piece of
5 information.

6 CHAIRMAN FROINES: I understand that, but do
7 you know the -- can you compare chromium 6 chronic REL
8 with the carcinogenicity data?

9 Have you got the numbers -- for 2588, one
10 predominates over the other, right?

11 DR. MARTY: Generally the cancer risk
12 overshadows anything that we would get from chronic
13 RELs, generally.

14 DR. FUCALORO: Aren't they incomparable in the
15 sense that the cancer risk is not given with a
16 threshold?

17 DR. MARTY: Correct.

18 CHAIRMAN FROINES: But you can calculate a 10
19 to the -5 risk, which if you use that or a 10 to the -6,
20 whatever your state policy is, you can determine the
21 dose at that point which you would argue is protective
22 or not protective.

23 DR. SALMON: I think the point at which this
24 comparison is usually made procedurally is when the Air
25 District or whomever, is developing their local control

1 criteria, they look at the things for which there is a
2 cancer potency and they look at the things in which
3 there is a chronic REL.

4 They have locally set criteria for what
5 actions will be triggered by a given risk level of
6 cancer, or a given hazard index relative to the REL.
7 So it's actually at that level of the process that this
8 comparison, if you like, is formally done.

9 We don't write a narrative for these
10 documents, making that comparison.

11 DR. BLANC: Actually, can I make a follow up
12 on his comment? This would be analogy issues, not to
13 the comparison with the cancer risk factors which
14 you've developed separately. But we talked a little
15 about how poor the data are for acrolein. Because we
16 know that in humans it's more toxic acutely than
17 formaldehyde on a part per million basis.

18 One analogy, that you would want to make sure
19 that your REL for acrolein is somewhere near what it
20 was for formaldehyde, and comment on that. Because if
21 it's like 10 times higher than formaldehyde, it
22 wouldn't make biological sense, I would say.

23 So that would be one thing you might want to
24 comment on.

25 DR. MARTY: I'm pretty sure it's a couple of

1 quarters of magnitude lower.

2 DR. BLANC: Which is reassuring.

3 CHAIRMAN FROINES: What?

4 DR. BLANC: Lower.

5 DR. MARTY: Acrolein is a couple of quarters
6 of magnitude lower than the formaldehyde REL.

7 DR. BLANC: And similarly, you would want to
8 make sure that your Chlorine dioxide one comes out
9 somewhere near what you've got for chlorine. There is
10 no reason to think that chlorine dioxide is safer than
11 chlorine, but there is a whole lot more data for
12 chlorine than there is for chlorine dioxide.

13 So I know you can't actually make your --
14 you're forced to make your standard based on what you
15 have, but just to reassure yourself and make the
16 comment.

17 DR. SALMON: Formaldehyde is 3 micrograms per
18 liter cubed and chromium is 0.06 micrograms per liter
19 cubed.

20 CHAIRMAN FROINES: That is good.

21 DR. BLANC: That is what you want.

22 CHAIRMAN FROINES: We would like that, we like
23 that because acrolein is a very potent compound.
24 Formaldehyde isn't.

25 The only one I think is more potent, I think,

1 is Roger's formaldehyde, which I would love to see how
2 toxic that is. Peter?

3 DR. KENNEDY: Four compounds, carbon
4 tetrachloride, beginning on A 44.

5 I have the same question that was raised just
6 with the presentation of the data that the Adams study,
7 almost 50 years old, takes most of your text and has
8 lots and lots of information. And after a while it
9 becomes less clear as you go through the copy that
10 these are all from the same study.

11 They are looking at different issues and
12 different ways, and the ultimate conclusion is
13 generally the same related to liver damage, due to
14 nutriliplid increases.

15 There were -- the more elegant analysis is
16 really the more recent one, where they looked at
17 specific enzyme systems for 50 levels.

18 And just for my own benefit, they, and I guess
19 you, make the comment that intermittent exposure
20 produces more pronounced and higher numbers of changes
21 than does continuous or monotonous exposure.

22 Why is that so? Does anybody know?

23 DR. COLLINS: That's what was seen in the
24 limited data available, it is hard to tell.

25 DR. KENNEDY: That just seems sort of

1 intriguing.

2 There were no surprises certainly in the
3 results of all of these observations, and I think your
4 conclusion is correct insofar as specifically the
5 study, the section of the study from the Adams data
6 that you chose to use does have small sample size.

7 And again in that section there is a little
8 dose response correlation, although I'm not sure that
9 the Adams study, as I understand it, does not give you
10 a fairly extensive dose response exposure. So, I guess
11 I'm a little bit confused by that, by the multiple dose
12 studies, the criticism of the data, it's certainly
13 there. It just looks like you have chosen not to use
14 it, specifically for the REL.

15 That is really all I have on carbon
16 tetrachloride.

17 Chlorobenzene.

18 CHAIRMAN FROINES: Peter, can I just say one
19 thing?

20 Here you list, this is a trivial point, but
21 you have the inhalation reference exposure level as
22 .006 PPM. If you look at acrolein, it's .03 PPB. I
23 think you just need to make sure that your units cross
24 your different compounds.

25 DR. SALMON: I think we have it as parts per

1 billion at the start, and you're saying that you would
2 prefer to see the PPB figure first?

3 CHAIRMAN FROINES: No. I don't care.

4 It is a question of consistency. Go ahead,
5 Peter.

6 DR. KENNEDY: Okay. There are not a lot of
7 data presented on chlorobenzene.

8 I think I agree with you that the 2
9 generational developmental study was appropriate to be
10 selected for NOAEL, but certainly not because it is a 2
11 generation study, it just gives you good careful
12 listopathological analysis and fairly broad dose
13 response relationship.

14 This is the one where there are changes that I
15 don't understand, differences in platelet and white
16 cell counts, red cell counts and hemoglobin.

17 The mechanism for deviations here are not
18 necessarily consistent. I think this is the one that
19 it was not again dose related, and I'm not sure that
20 that is necessarily a reason to support your use of the
21 study.

22 DR. MARTY: That's the Dillay 1977?

23 DR. KENNEDY: Yes.

24 DR. SALMON: That was one of the reasons that
25 we merely saw that as a course of study.

1 DR. MARTY: We did use it as a basis for the
2 REL, but saw it as a supporting study.

3 DR. KENNEDY: I have no other major issues,
4 what was there was solid.

5 Dichlorobenzene, you have, most of this is --
6 you have three species, and all the findings are fairly
7 consistent from one study to the next.

8 You have a little bit of tantalizing
9 information on reproductive issues, but I would agree
10 not enough to take to the bank.

11 I had no other major issues. I was sort of
12 intrigued by the hematuria as to whether that was a
13 consequence of extensive liver damage and coagulation
14 problems as opposed to being a specific renal effect.

15 But that is just me.

16 I think that the data otherwise is consistent.

17 The last one is Chlorine dioxide.

18 CHAIRMAN FROINES: That is Dr. Witschi.

19 You are welcome to do it.

20 DR. KENNEDY: I'm done.

21 CHAIRMAN FROINES: Okay. You said that you
22 haven't gotten any comments from Witschi?

23 DR. MARTY: Not from Dr. Witschi. We did get
24 a few from Dr. Friedman on his two chemicals.

25 CHAIRMAN FROINES: That creates a problem in

1 terms of approving the overall document, because we do
2 not know whether Peter has major or minor comments.

3 What shall we do?

4 DR. GLANTZ: Is there a reason that we need to
5 act, especially in light of the fact that I ran off
6 with the wrong copy?

7 I suggest that we put off final action until
8 the next meeting so that we can hear from him. And
9 also in the meantime, I can either bring to the meeting
10 or give to the staff, depending on what my notes say,
11 my comments. Unless there is a rush, I would feel more
12 comfortable if we can hear from him.

13 DR. FUCALORO: I mentioned, I gave some
14 comments in writing, and I left those home so I assume
15 that you have them, because I can see at least some are
16 not incorporated, but I have looked at others.

17 These should be brief, if you don't mind I can
18 just go through it.

19 A 7, Arsenic.

20 Vapor pressure. Millimeter mercury, stick
21 with one unit, scratch that. And given the
22 temperature, I assume it's arsenic, although it's not
23 explicitly stated.

24 DR. COLLINS: The boiling point.

25 DR. FUCALORO: Vapor pressure. I assume that

1 is what that is.

2 A 44, you have vapor density 5.3 at the
3 boiling point. Let me give you a clue and I'm sure how
4 this is done. It's the ratio of the molecular weights.
5 That's all they're doing there.

6 They are taking the ratio of the molecular
7 weights, they are assuming the average molecular weight
8 of air is 29, the molecular weight of the carbon tet is
9 153.8, the ratio of that is .3.

10 That is how they are doing it. They are just
11 using the ideal gas equation, reformulated molecular
12 weights.

13 DR. SALMON: So you're saying that is --

14 DR. FUCALORO: Oh, you know, who the hell
15 knows.

16 I don't know if you should put something like
17 that in, I'm just pretty sure that is what they are
18 doing.

19 DR. SALMON: Probably not.

20 DR. FUCALORO: That is what they are doing.

21 DR. SALMON: We will strike that one.

22 DR. FUCALORO: A 64, that is hexavalent
23 chromium, again, density you have as 2.70 grams per
24 cubic centimeter.

25 DR. COLLINS: Chlorine trioxide.

1 DR. FUCALORO: Just put it down.

2 DR. MARTY: About the vapor density, I am
3 remembering from earlier discussions that Dr. Blanc,
4 maybe I'm not remembering this right, but for gases
5 that were heavier than air, he thought it was important
6 because they are going to sink and so you are going to
7 be where they are.

8 DR. FUCALORO: The simple fact is that if you
9 look at the molecular weight, it's either molecular
10 weight is heavier than the average of air, which is 29
11 about, then it's going to sink.

12 DR. MARTY: So you don't really need to be
13 explicit.

14 DR. FUCALORO: But either way I don't care.
15 I'm just informing you, I'm sure that is how they do
16 it.

17 If anyone wants to get the density of a gas
18 and compare it, it is just a ratio of molecular weight.

19 I don't mind if you put in 5.3, honestly.

20 A 79. Just to point out, interesting vapor
21 pressure, both Roger and I noticed, and Roger mentioned
22 how these values were different than the ones you had
23 in the part 4 document.

24 They weren't inconsistent, they were different
25 because of the different temperatures, but if you

1 noticed both ortho and paracresol, temperatures of 25
2 degrees, you must be getting the vapor pressure of the
3 solid.

4 DR. ATKINSON: This is an even worse problem
5 -- they do not look consistent with the melting point,
6 is the other problem. Because orthocresol, and
7 paracresol are still solid at 25. The orthocresol
8 apparently has a higher vapor pressure than the other
9 two, and I think that is the wrong way around.

10 I think you will find the metacresol has the
11 higher vapor pressure of 25, since it's a liquid.

12 DR. SALMON: We will check the source on that.

13 DR. FUCALORO: It just looked peculiar to both
14 of us.

15 Dichlorobenzene, A 87, again both Roger and I
16 were a little confused, where you have a melting point,
17 53.1 degrees centigrade, and then in parentheses you
18 say sublimes, and then it has a boiling point. It
19 doesn't seem right to me.

20 DR. ATKINSON: It does seem inconsistent.

21 DR. FUCALORO: At any phase diagram you can't
22 have, there is one point, literally a point in which a
23 gas and a liquid can coexist, and that is a triple
24 point. It's probably not the triple point, so that is
25 meaningless.

1 A 107, that is also some problems with
2 molecular weights. I am not sure if you corrected some
3 of it.

4 DR. COLLINS: There is a typo in the molecular
5 formula.

6 DR. FUCALORO: Yeah, right. In fact here it
7 is, in one, two, epoxy butane.

8 A 119, I am trying to get through it quickly,
9 because I have a plane to catch. We're moving faster.
10 I'm not sure about those density milligrams.

11 DR. COLLINS: It should be grams per liter,
12 because 1 PPM will be milligrams per cubic meter.

13 DR. FUCALORO: That's wrong. That is clearly
14 wrong. My guess is --

15 DR. COLLINS: Oh, no, it should be grams per
16 liter.

17 DR. FUCALORO: Grams per liter. I'm just
18 giving my sense of what these densities are.

19 Actually I did a thumbnail calculation. It is
20 grams per liter, which would be kilograms per meter
21 cubed.

22 165, and this ends it for me.

23 DR. COLLINS: Paul went over those too. It
24 was 2,4 TDI that all those boiling point, melting
25 point, and vapor pressure refer.

1 And I think as far as the olive oil, it was an
2 oil that they had, that is all. They happened to pick
3 olive oil.

4 DR. FUCALORO: I particularly have an interest
5 in those sort of things given my heritage, but I
6 suspect that not everyone -- you can keep it in, it
7 just looks funny.

8 DR. SALMON: I think the early chemists may
9 have used that as a surrogate for log P and other more
10 sophisticated measures.

11 DR. FUCALORO: Well, it is a wonder oil. I
12 personally will support olive oil in almost anything,
13 but I have no scientific proof.

14 I'm finished, thank you.

15 CHAIRMAN FROINES: Okay.

16 I want to make one general comment. George
17 ought to hire some people whose area of research is
18 exposure. I think the major uses or sources that you
19 do throughout this entire document are all primarily
20 secondary, and just copied from some other document
21 some place.

22 And in that sense they are not very good, if
23 you want my honest opinion, because they are obviously
24 secondary references. And so they do not reflect any
25 knowledge base of California uses. So it weakens -- in

1 a sense, anyone who reads this who wants to learn about
2 what might be problems in California, throughout this
3 whole document you basically get this litany of things,
4 most of which have no relevance whatsoever.

5 We have to deal with that over the long term,
6 that is not a short-term issue.

7 In California, Chromium is used in two
8 different places. It is used as pigments in the
9 aerospace industry, and it is used in electroplating,
10 and that is pretty much the whole thing.

11 There are probably some other uses, but those
12 are the two that really make a difference.

13 So, if you are worried about it, if you live
14 near Northrop or Boeing, or what have you, that is an
15 issue. This long list of things is not an issue, and
16 to the degree that it conveys that it is an issue, it
17 shouldn't.

18 So, I have a problem with -- and the second
19 thing is the reporting of the emissions under the Air
20 Toxic Hot Spots Act, isn't that dependent upon who
21 somebody decides should do a risk assessment?

22 That is not a generic requirement, is it?

23 DR. MARTY: All of the facilities that are in
24 the program have to report emissions, but they don't
25 all have to write a risk assessment.

1 CHAIRMAN FROINES: Who gets into the program?

2 DR. MARTY: Well, virtually everyone who emits
3 chromium gets into the program. All of the chrome
4 platers are in the program.

5 CHAIRMAN FROINES: There is no lower use
6 level?

7 DR. MARTY: It's a pretty small lower use
8 level for reporting.

9 CHAIRMAN FROINES: So you think that this
10 represents a fairly wide distribution of use of
11 chromium in California? Or any other chemical for that
12 matter?

13 DR. MARTY: I think that it should represent
14 but I cannot comment on how good the inventory is. I
15 actually have qualms about how good the inventory is,
16 especially when there's a lot of little sources. A lot
17 of the emissions reporting is they are basically
18 looking at their emissions throughput and then making
19 guesstimates based on that.

20 CHAIRMAN FROINES: This issue of exposure, we
21 cannot deal with here, so I want to raise it as --
22 uses, exposure, those kinds of questions are so
23 critical and yet they are the things that we don't
24 really know much about, and it hurts us I think in the
25 long run.

1 Anyway, let me just make a few comments about
2 chromium. I have one kind of major comment that
3 bothers me, and I will be interested to get input from
4 other people on this Panel.

5 Under your derivation of the -- for soluble
6 hexavalent chromium compounds other than chromic
7 trioxide, you use a study from 1996, and there is no
8 LOAEL, in fact there were no adverse effects
9 identified.

10 I'll tell you, I have a serious problem with
11 using studies where there is no adverse effect
12 identified. You did it in aluminum, in drinking water,
13 you do it here, and I hope it's not done much else.

14 It's a decision to pick a study where no
15 adverse effect is used, and then to define that as a
16 NOAEL. I do not think that it represents the most
17 sensitive -- it is not the most sensitive effect. It
18 is a non-effect in a study which finds no positive
19 finding.

20 So I really do have a lot of difficulty with
21 the selection of a study for which there is no adverse
22 effect identified. I understand about -- I mean we
23 have obviously done a lot of research on chromium in
24 the last few years and I understand about damage to the
25 nasal septum and so on and so forth, and everybody in

1 this field knows about that.

2 So I'm not quarreling with the fact that there
3 aren't studies that find it, but when you pick a study
4 for which the pulmonary function changes are
5 essentially non-existent, and presumably you didn't see
6 any nasal septum changes, and then define that as a
7 NOAEL, that doesn't really fly, it seems to me.

8 I don't understand the basis for that
9 decision.

10 DR. COLLINS: The real NOAEL is higher.

11 CHAIRMAN FROINES: It could be higher, it
12 could be lower. It probably isn't lower.

13 It could be certainly higher.

14 DR. BYUS: I ran in to this problem when we
15 were doing methyl parathion as well. We actually
16 didn't choose any that didn't have any effects. But
17 when you have a study and you are looking for something
18 and you do not find that thing, whatever you're looking
19 for, and you may cursorily look around for other
20 things, you don't actually really do it quite as well,
21 I think is the point.

22 Do you see what I'm saying, so you might
23 really miss something.

24 Not because you did not want to but you are
25 not looking in the right way. But if you have a study

1 that has a positive effect it could go both ways, but
2 that is one of the reasons.

3 It is a little --

4 CHAIRMAN FROINES: I have not read the study,
5 so I don't know anything about the quality, but Paul
6 Blanc does know the quality of that Charlie Becker
7 study that he commented on in terms of ethylene oxide,
8 and he knew the study had problems.

9 Occupational studies can be very good or very
10 bad, as we know. So, I don't know, I can't judge it.

11 So, it is hard to accept a study in which
12 there is not some information on dose response or some
13 LOAEL identified.

14 DR. MARTY: I think one of the reasons that
15 this study ended up being chosen is that it is
16 consistent with the rest of the data where effects are
17 observed.

18 The alternative is to take a study where
19 effects were observed and call that a LOAEL, and add in
20 other uncertainty factors. What we should do is do
21 some comparisons to see where they all end up when you
22 look at them all together.

23 DR. GLANTZ: I think, Melanie, that would be
24 much better, because, I mean to take an extreme case,
25 suppose someone went out and did a study where they

1 didn't have any exposure and didn't find any effect.

2 Then you'd say the NOAEL is zero.

3 I agree with what John is saying. You want to
4 have some dose where they have some effect, so you at
5 least have a range.

6 So I think, if what you are saying was that
7 these data are consistent with these other studies, I
8 think putting that in would help address the problem.

9 CHAIRMAN FROINES: I would like you to do a
10 comparison of human data with animal data, so we see
11 where the numbers come out.

12 DR. MARTY: Okay.

13 CHAIRMAN FROINES: The second question I have
14 relates to Lindberg study. I had the benefit that I
15 was the only person who had much in the way of comments
16 so I could use them, but I didn't find them
17 particularly persuasive.

18 But the Lindberg study, it is interesting that
19 your average exposure turns out to be .68 micrograms
20 per cubic meter, although your LOAEL is at 1.9. And
21 you get to the .68 basically by adjusting for
22 environmental exposure, as I understand it.

23 And in terms of these chronic RELs that that
24 is adding a safety factor. You have a human study in
25 which you have an exposure where you find an effect at

1 1.9 microgram per cubic meter.

2 You are then saying that if a person were
3 exposed on a chronic basis to a level that is three
4 times lower, that on an environmental context, that
5 could end up causing the health and nasal atrophy, and
6 the other nasal end points that you saw in the
7 occupational study.

8 But we don't really know that because you do
9 not have a study that finds nasal effects at .68
10 microgram per cubic meter. So in essence, you are
11 adding the safety factor to assume that it might be
12 possible at .68 you will see chronic effects.

13 DR. SALMON: What we are assuming with that
14 calculation is that the exposure for 8 hours a day, 5
15 days a week, at the level of 1.9, is equivalent to
16 continuous 24 hours a day 7 days a week exposure, at
17 the proportionately lower dose.

18 So the net exposure over a period of seven
19 days is the same for the two scenarios. It is an
20 assumption, obviously.

21 CHAIRMAN FROINES: I understand that, I
22 understood it before you said it. It is different than
23 carcinogenesis in this case, because I understand that
24 adjustment, we always do that adjustment.

25 Here there is a little different issue.

1 You are finding an effect at a particular dose
2 over an eight-hour period. You do not necessarily know
3 that you will see the same LOAEL effects at .68 over a
4 24 hour period over the same time duration. So you are
5 making an assumption.

6 DR. SALMON: Certainly. For want of better
7 information, that seems to be a reasonable and cautious
8 assumption. That is all we can say to defend it.

9 CHAIRMAN FROINES: I agree. I do not
10 necessarily disagree with the conclusion.

11 In this case it's not just an adjustment,
12 there is a decision about how to interpret the data.
13 It's not just an adjustment from eight-hour time
14 weighted average for occupational exposure, to 24-hour
15 five-day a week or seven-day a week exposure. It's not
16 just an adjustment. There is an assumption inherent
17 within that.

18 Do you see what I am saying?

19 It's not simply an adjustment, it is a
20 statement that you will see the same effect over the
21 time frame. Say 8 hours a day, 40 hours a week will
22 give you a certain effect on the nasal septum. And
23 that you will see that same effect 24 hours a day at
24 .68. And so when you make that assumption, you are
25 basically making a conservative estimate which I think

1 is a safety factor that you're applying.

2 It's not simply an adjustment.

3 DR. SALMON: The question is whether we know
4 whether the effect is basically proportional to the
5 total dose over the long duration, or whether it's
6 proportional to the current level.

7 In this case I think the judgment we made was
8 that we don't know, and therefore we would take the
9 more cautious of the two possible interpretations.

10 I do not know what else we could do unless we
11 had more information about the nature and time course
12 of the effect.

13 CHAIRMAN FROINES: What you would like to
14 have, of course, is a study at .68 micrograms per cubic
15 meter, over an extended period of time, and found nasal
16 effects.

17 DR. SALMON: Yes.

18 CHAIRMAN FROINES: And you don't have that, so
19 you make this assumption.

20 I think it is important that people realize
21 that you are making that assumption, because I do not
22 think it is simply an adjustment. It is a decision,
23 because the industry would argue, I think, that you
24 should have used 1.9, because that is the level at
25 which you found effects.

1 So, to make that adjustment is to make the
2 assumption that those effects would have occurred.

3 DR. MARTY: I'm not sure whether we described
4 it as a -- well I don't think we did, as a safety
5 factor in the methodology section, but we definitely
6 discussed that we do that in the methodology section.
7 It is explicit in there of the part 3 document.

8 CHAIRMAN FROINES: I did not go back and look
9 at it, but it seems to me in that document it's worth
10 making an explicit statement, if it is not explicit.
11 And I honestly do not know that what you are doing is,
12 because I don't think it is an adjustment.

13 It is not just a time adjustment, it is a
14 statement about biological mechanism. You are assuming
15 that those effects may occur at a lower dose. And one
16 could argue that the inflammatory responses from
17 chromium may be a high dose phenomenon, and you might
18 not see it at .68.

19 DR. SALMON: I think it is a fundamental
20 methodological assumption, which is in the methodology
21 section, that the types of effects which are being
22 studied for chronic RELs, generically are the types of
23 effects that would accumulate over a 24-hour or seven-
24 day period, which is essentially what we are saying
25 here.

1 And clearly, I think in the absence of
2 evidence, that is something that is an assumption and
3 one that could be questioned for anything which you
4 think of as acting primarily as an irritant, as opposed
5 to perhaps a cell toxicant in a slightly more systemic
6 mode.

7 And certainly we have from the technical, and
8 sort of methodological standpoints, significant
9 questions about how we should treat things that are
10 functioning as quote unquote, pure irritants when we
11 are looking at time integration.

12 Whether chromium 6 or chromate salts are good
13 candidates for being considered pure irritants at this
14 sort of level, I don't know. Certainly at higher
15 levels I tend to think of them as cellular toxins
16 rather than pure irritants.

17 But, this is something, where, as we said, we
18 don't simply have the information, so we are required
19 to make a cautious assumption, which is our default in
20 the methodology.

21 CHAIRMAN FROINES: I think it is an
22 interesting issue with chromium because if you say,
23 what do you think happens with sulfuric acid mist, I
24 think there you would argue what you are seeing is, by
25 and large, a response to a strong acid.

1 So, one could argue that with chromic acid,
2 for example, that you are seeing something that is not
3 entirely dissimilar. But chromium is a complicated
4 molecule, and so you could be seeing all sorts of
5 inflammatory mechanisms going on that meet your
6 definition of chronicity, in terms of long-term
7 effects.

8 So, I think chromium is actually on a -- I
9 don't know if it's on a cusp, but you could argue it, I
10 think, quite acceptably that you need to consider it in
11 terms of its chronic toxicity because it is not
12 sulfuric acid.

13 So, I'm not saying this should be changed.

14 DR. SALMON: We will address that in more
15 detail in the narrative, if you feel that's
16 appropriate.

17 CHAIRMAN FROINES: I don't think that you need
18 to do anything really in here.

19 I just noticed it and was thinking about it
20 from the standpoint, of this issue that we are just
21 talking about now, with is about sulfuric acid versus
22 chromic acid, versus acute, versus chronic, and what
23 that adjustment ends up being.

24 So I think you should leave it, as long as
25 it's addressed effectively in the methodology section.

1 So, that is everything that I had.

2 DR. FUCALORO: Just another thing on A 65, the
3 effect of human exposure, Roman IV, Phosphates, second
4 line --

5 CHAIRMAN FROINES: The inhalation reference
6 level for chromic acid is .002 micrograms per cubic
7 meter, what is the 10th to the minus 5 risk dose or
8 value, for cancer?

9 DR. COLLINS: Well, potency is .15, so .15 X
10 .002 would be 3×10^{-4} .

11 CHAIRMAN FROINES: This is 30 times, so it's
12 in the ballpark, but still for cancer -- okay.

13 Okay.

14 DR. ATKINSON: I have a couple of comments,
15 but I have marked them, so they are all on the first
16 sections in each one, either the physical properties or
17 the emissions, so I will just give them to you.

18 CHAIRMAN FROINES: As an issue of toxic air
19 contaminants, I think it would be useful for us to have
20 a talk sometime, since we haven't had a chemical
21 brought before -- a specific toxic air contaminant
22 brought before the committee in at least five years.

23 When was lead finished?

24 DR. MARTY: Lead was '97 and diesel was '98.

25 CHAIRMAN FROINES: I mean diesel was brought

1 to the Committee way back and so was lead. So, in
2 terms of new chemicals it has been, with the exception
3 of pesticides --

4 DR. SALMON: Apart from MTBE, of course.

5 DR. FUCALORO: In other words he's saying, get
6 the lead out.

7 CHAIRMAN FROINES: I think we should have a
8 discussion sometime about aldehydes.

9 DR. MARTY: Happily.

10 DR. SALMON: I would love to do that, yes.

11 CHAIRMAN FROINES: So, let's entertain a
12 motion to adjourn.

13 DR. FUCALORO: So moved.

14 DR. KENNEDY: Second.

15 CHAIRMAN FROINES: All in favor.

16 (Ayes.)

17 (Thereupon the SRP meeting was adjourned
18 at 4:10 p.m.)

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