MEETING

STATE OF CALIFORNIA

ENVIRONMENTAL PROTECTION AGENCY

AIR RESOURCES BOARD

SCIENTIFIC REVIEW PANEL

ON TOXIC AIR CONTAMINANTS

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

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Ken Kloc, Ph.D., Community Health and Environmental Impacts Section

I N D E X

P R O C E E D I N G S

CHAIRPERSON ANASTASIO: Good morning, everyone. I'd like to call this meeting to order. Welcome to the Scientific Review Panel meeting. First, I'd like to welcome everyone who's watching on the webcast. And let's go around and introduce ourselves.

Court Anastasio, Chair of the Panel and a Professor at UC Davis.

Lisa, would you go next.

PANEL MEMBER MILLER: Yes. Lisa Miller, Professor at UC Davis.

PANEL MEMBER BESARATINIA: Ahmad Besaratinia, Department of Preventive Medicine, University of Southern California.

PANEL MEMBER BLANC: Paul Blanc, University of California, San Francisco.

PANEL MEMBER KLEINMAN: Mike Kleinman, UC Irvine.

PANEL MEMBER RITZ: Beate Ritz, UCLA.

PANEL MEMBER LANDOLPH: Joe Landolph, Associate Professor, Departments of Molecular and Microbiology and Immunology and USC Norris Comprehensive Cancer Center at University of Southern California.

CHAIRPERSON ANASTASIO: Kathy and Stan, can you chime in?

PANEL MEMBER HAMMOND: This is Kathy Hammond at

UC Berkeley.

PANEL MEMBER GLANTZ: And Stan Glantz at UCSF.

CHAIRPERSON ANASTASIO: And Kathy and Stan, can you please make sure to mute your phones when you're not talking. And everyone else don't forget to turn on you microphones when you are talking.

Okay. So handouts of today's materials, including comments received from American Coatings Association and the Southern California Alliance of Publicly Owned Treatment Works are available on the table in the back of the room.

A few administrative items. Restrooms are leave the door, take a left. Drinking fountains are down there too. If there's a fire alarm, please exit down the stairs and proceed outside the building.

Okay. So today's meeting, two major agenda items. The first item we're going to review the proposed cancer inhalation unit risk factors for para-chlorobenzotrifluoride, PCBTF. And then the second item will be a review of the proposed updates to the chemical lists in appendix A of the AB 2588 Air Toxics Hot Spots Emissions Inventory Criteria and Guidelines regulations. And we'll be discussing the draft letter of interim findings from the Scientific Review Panel.

Okay. So with that, let us begin.

So I'm going to start the first agenda item, the PCBTF. So this is a document we received from the Office of Environmental Health Hazard Assessment. It went through public review and comment during 2018 and '19. The document was then revised and sent to the Scientific Review Panel in January of 2020. Also posted on OEHHA's website for the public.

And so today we're going to start by a presentation from OEHHA staff on the proposed cancellation inhalation unit risk factors. And then there will be a panel discussion and we'll give our feedback to OEHHA. So I'm going to turn it over to John Budroe from OEHHA.

(Thereupon an overhead presentation was Presented as follows.)

DR. BUDROE: Thank you, Dr. Anastasio. I'd like to make two introductions before we get started. One is Dr. Ken Kloc, who is the lead author on this document and is kindly on lone from the Community Health and Environmental Impact Section at OEHHA. And then to his right, Dr. Vince Cogliano, who is our new Deputy Director for Scientific Programs at OEHHA.

CHAIRPERSON ANASTASIO: That's great. Welcome, Vince.

DR. COGLIANO: Thank you very much.

DR. BUDROE: So the chemical for which we'll be

discussing the inhalation cancer unit risk factors this morning is para-chloro-alpha,alpha,alpha-trifluorotolouene And it's more commonly referred to in the literature para-chlorobenzotrifluoride, or PCBTF.

And if somebody could launch the PowerPoint presentation.

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DR. BUDROE: Okay. The first slide shows selective physical and chemical properties of PCBTF, and that's also the structure.

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DR. BUDROE: PCBTF is used in the preparation of dyes, pharmaceuticals, pesticides, and as a solvent in --

PANEL MEMBER GLANTZ: This is Stan. I'm not seeing the sides.

DR. BUDROE: Right now we aren't either. We seem to be in sign-in limbo.

PANEL MEMBER GLANTZ: Okay. Now there -- I can see them.

Can you hear me? My phone just made a weird noise?

PANEL MEMBER BLANC: Yes, we can hear you.

PANEL MEMBER GLANTZ: Oh. Okay. Is there no slides yet?

PANEL MEMBER BLANC: Yes, there are no slides

yet.

DR. BUDROE: Okay. It looks like we have slides again.

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DR. BUDROE: Okay. I'm going to restart the uses and exposure potential slide.

PCBTF is used in the preparation of dyes, pharmaceuticals, and pesticides, and as a solvent in paints, inks, high solids, coatings, and it's also used for metal cleaning. Production in and import into the U.S. was roughly 5,000 to 25,000 tons per year from 2012 through 2015. However, little information is available regarding air emissions of PCBTF in California. And I'll note that right now, PCBTF is not on the hot spots inventory list.

Exposure could occur from the use of products that contains PCBTF from contact with contaminated groundwater or soil or from consumption of food products containing PCBTF residues.

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DR. BUDROE: Now, looking at toxicokinetic data for PCBTF, limited information from rat studies indicates that it is readily absorbed, both orally and by inhalation. NTP in 1992 noted 100 percent absorption in rats exposed to 10, 50, or 400 milligram per kilogram by

oral gavage.

And a rat blood-air partition coefficient of 43.7 was noted by Knaak in 1997. And this is the ratio of the concentration of blood versus the exposure concentration.

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DR. BUDROE: And PCBTF is widely distributed throughout the body with a tendency to concentrate in fatty tissues. The table above shows tissue concentrations in female rats exposed by inhalation to 390 milligram per meter cubed for six hours. And those concentrations there are in micromoles per liter. And they range from almost a thousand micromoles per liter of fat down to about 20 for muscle.

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DR. BUDROE: In rats, PCBTF is mainly excreted unchanged via exhalation, in a range, depending on which reference you look at, 60 to 80 or 80 to 90 percent. It is secondarily metabolized via aromatic hydroxylation and excreted conjugated phenolic compounds. And it is converted in small amounts to mercapturic acid metabolites.

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DR. BUDROE: A physiologically-based pharmacokinetic, or PBPK, model was developed for PCBTF in inhalation exposure to rats in humans by Knaak in '95.

And then that model was improved in 1998. It included compartments for liver, brain, fat, kidney slowly and rapidly perfused organs. And metabolism is represented by model components for CYP450 oxidation in the liver, glucuronide conjugation of phenolic metabolites, and glutathione conjugates.

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DR. BUDROE: OEHHA did not use this model in the document, because it was judged to be incomplete. The model was inadequately validated. The only in vivo data available to verify the model was from the single 50 parts per million exposure concentration in female rats.

Second, the blood and tissue concentration of the PCBTF predicted by the rat model deviated from the experimental data during post-exposure periods.

Also, the human model was not based on experimentally derived metabolic constants, nor was it tested against experimental data.

And finally, it was less useful than it could have been, since there was no mouse model.

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DR. BUDROE: The cancer hazard and dose-response evaluation of PCBTF is based on recent animal cancer studies by the National Toxicology Program, or NTP. And this -- they released this report in 2018. NTP exposed

both sexes of B6C3F1 mice and Sprague-Dawley rats in groups of 50 by inhalation for 6.2 hours per day, five days per week, 104 to 105 weeks exposure.

Mice were exposed to 100, 200, or 400 ppm, and rats to 100, 300, or 1000 ppm. The animals were necropsied at terminal sacrifice and histopathological examination of all relevant tissues, more than 40 sites, was performed.

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DR. BUDROE: Now, this table shows the unadjusted tumor incidence in exposed mice.

And sorry for the holdup, but I forgot my distance glasses today, so I can't read the slides correctly.

Tumor incidence in mice -- increased tumor incidences compared to controls were seen at the mid and high dose in female mice for harderian gland adenomas or adenocarcinomas. Also at the mid and high dose for hepatoadenomas, carcinomas or hepatoblastomas. And there was also positive trend for test for both those tumor types.

In male mice, increased hepatocellular adenomas, carcinomas, or hepatoblastomas were seen at the mid and high doses and again was a positive trend for tumor.

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DR. BUDROE: In rats, female rats, significant increase in adrenal medulla, benign or malignant pheochromocytomas was seen at the high dose. Significant increase was also seen at all doses for thyroid gland C-cell adenomas or carcinomas. And there's also a positive test for trend.

In -- a significant increase at the mid dose was scene in uterine stromal polyps or sarcomas. And then finally, there was no individual dose significant pairwise comparison with controls, but there was a positive test for trend for uterine adenocarcinomas.

And then in the male rats, there was a -- the high does was significantly increased for thyroid gland C-cell adenomas or carcinomas, and there's also a positive test for trend.

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DR. BUDROE: And no studies of increased cancer incidence in humans resulting from PCBTF exposure were identified in the literature.

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DR. BUDROE: Now, ancillary data for supporting car -- the carcinogenicity data for PCBTF. Genotoxicity date for PCBTF came from several published studies and unpublished industry reports. And there were three studies on DNA damage and repair, one was positive; eight

studies on gene mutation, all were negative; and seven studies on chromosomal damage, and two of those were positive.

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DR. BUDROE: Negative results were reported for DNA damage and gene mutation assays in bacteria and yeast, chromosomal damage assays in yeast, and gene mutations in mouse lymphoma cells.

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DR. BUDROE: Positive results were observed for unscheduled DNA synthesis, or UDS, in human embryonic epithelial tells, and sister chromatid exchanges, or SCEs, in mouse lymphoma cells. And there mixed results for in vivo mature erythrocyte micronucleus formation. It was negative in male and female rats, and female mice, positive in male mice.

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DR. BUDROE: Now, the NTP studies were well designed and implemented lifetime studies, carried out in both sexes of B6C3F1 mice and Sprague-Dawley rats. And the studies found that lifetime exposure of rats and mice to PCBTF by inhalation can produce an elevated incidence of tumors in the following tissues:

For female mice, harderian gland and liver; male mice, liver; female rat, adrenal demand, thyroid gland,

and uterus; and in male rats, thyroid gland.

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DR. BUDROE: PCBTF is readily absorbed in rats and is subject to oxidative metabolism, which could result the production of potentially genotoxic metabolites. The metabolism of PCBTF in humans is likely to be qualitatively similar to that observed in the rat. The available genotoxicity data provides limited evidence that PCBTF is a genotoxic substance. However, the carcinogenic modes of action of PCBTF are not known.

OEHHA recently listed PCBTF as a substance known to the State to cause cancer under Proposition 65. And we just found out yesterday, in the 20 -- January 2020 issue of Lancet Oncology, IARC has announced that in the volume 1 -- their monograph volume 125 that PCBTF will be listed as a 2B carcinogen.

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DR. BUDROE: Now, OEHHA's standard approach to deriving a cancer slope factor and then the unit risk. Cancer risk factors are calculated for tumors with significant tumor incidence and/or positive dose response trend.

The risk factors are estimated for the incidence of one or more related tumors at each tumor site. And the quote from the OEHHA 2009 cancer -- hot spots cancer

technical support document, or TSD, "Tumor types considered to represent different stages of progression following initiation of a common, original, normal cell type are combined..."

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DR. BUDROE: OEHHA takes the crude incidence rates and adjusts them to correct for differential early mortality amongst dose groups. For this document, the data was modeled using U.S. EPA benchmark dose software, PMDS version 2.7.

The multi-stage cancer model is chosen for modeling, which is the OEHHA default for typical cancer data sets. And a benchmark response, or BMR, of five percent was used to calculate the benchmark dose or BMD.

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DR. BUDROE: The 95 percent lower confidence bound on the BMD(the BMDL) is then used to calculate cancer potency. And a multi-site BMDL is calculated when tumors occur at more than one site in the species. And for this purpose, OEHHA uses the BMDS multi-site tumor model, MS-Combo.

The resulting cancer slope factor, or CSF, is equal to the BMR, which in this document is 0.05 divided by the BMDL. And a cancer inhalation unit risk, or IUR, is then calculated from the CSF.

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DR. BUDROE: The -- now, the reason why OEHHA does a differential early mortality adjustment is that it avoids underestimation of risk if you have high early mortality.

And we generally use two adjustment methods:

Effective tumor incidence is used, and in this document, was used for the mouse data, where mortality differences of less than 15 percent are observed at week 85 of the study.

And then poly-3 adjustment, which in this document was used for the rat data is used where larger mortality differences, in the range of 15 to 30 percent, are seen at week 85.

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DR. BUDROE: Now, the effective tumor incidence is the number of tumor-bearing animals divided by the number of animals alive at the time of the first occurrence of the tumor.

In contrast, the poly-3 adjustment for each animal dying early without the tumor of interest, a fractional amount is added to the denominator according to the following equation: The contribution to the denominator is the time and study divided by two years to the third power.

And I'd like to note here that Dr. Glantz asked us to take a look at the difference in -- for the rat data between the adjusted incidence with using adjust -- effective tumor incidence and a poly-3 adjustment. And it made about a 10 to 30 percent difference between the tumor incidences. And it wasn't directionally biased. I mean, for some tumor types, poly-3 gave say a higher value for some of the other tumor types, the effective number gave a higher value, so -- but it's -- the difference between the two methods was not that significant.

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DR. BUDROE: This slide shows the adjusted tumor incidence in mice. And as I stated earlier, this was done just using effective number.

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DR. BUDROE: And this slide shows the adjusted tumor incidence in rats, and the adjustment was done using poly -- the poly-3 correction.

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DR. BUDROE: We then calculated a lifetime average daily dose, or LADD, for each of the exposed groups. And this was in units of milligram per kilogram body weight per day. The equation used is IR times C divided BW, where C is the time-adjusted exposure concentration, BW is the body weight, and C -- IR is the

inhalation rate.

And then the -- at the bottom of the slide shows the algorithms that were used to calculate either the mouse or the rat inhalation rates.

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DR. BUDROE: This slide shows the BMDS modeling results for the mouse tumor data. In the middle column, there is polynomial degree, that's the polynomial degree that was used to model that particular tumor type. And far right-hand corner -- column is the animal CSF in milligram per kilogram day to the minus one.

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DR. BUDROE: The next slide shows the BMDS modeling results for rats. These were all -- like the mouse data, these were all polynomial degree one. And for one group, the uterine, female uterine stromal polyps or sarcomas, the data from the highest dose group was dropped in order to obtain an acceptable fit.

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DR. BUDROE: And this slide shows the BMDS multi-stage stage cancer model plot fit for male mouse liver tumors.

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DR. BUDROE: The animal CSF values are then converted to human CSF values using body-weight scaling.

It's body weight to three-quarter power. The equation used for this is human CSFs are equal to animal CSFs times the body -- human body weight divided by animal body weight to the one-quarter power.

And interspecies weight-scaling adjusts for pharmacokinetic differences, such as breathing rate and metabolism, and for pharmacodynamic considerations, such as tissue responses to chemical exposure.

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DR. BUDROE: And this slide shows the human CSF's for male mice liver tumors. It was three times ten to the minus two. For female mice, mouse liver and harderian gland tumors multi-site, it was 8.8 times ten to the minus three.

For male rat thyroid in lung, two times ten to the minus three. And for female rat thyroid plus adrenal gland plus uterine tumors, 7.9 times ten to the minus three.

The largest human cancer slope factor was derived from male mouse liver tumors. It was three times ten to the minus two. And that was the value that was used to develop a cancer inhalation unit risk for PCBTF.

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DR. BUDROE: And the equation used to develop the IUR is the slope factor times the breathing -- human

breathing rate, which is 20 cubic meters per day, divided by an average human body weight is 70 kilograms, and a milligram to microgram conversion of a thousand.

So the resulting unit risk derived from the male mouse liver tumor data is an IUR of 8.6 times ten to the minus six, micrograms per cubic meter to the minus one.

And this is -- continuous means continuous lifetime exposure to one microgram per cubic meeting PCBTF is estimated to cause 8.6 additional cancers per million people exposed.

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DR. BUDROE: And this concludes the presentation on the document. We also have a response to public comments. I'd like the Chair to --

CHAIRPERSON ANASTASIO: Yeah. How about we pause here and see if there are any questions about the presentation and then we can continue with the response to public comments.

Questions on the presentation?

We finish with everything, then we'll go through like extensive comments. But I'm just wondering if there are any specific comments on John's presentation.

I have two questions, John. The first one is remind me, IARC 2B, what is the English translation of that category?

PANEL MEMBER BLANC: Animal I means

DR. BUDROE: Possible. I think it's possible.

PANEL MEMBER ANASTASIO: Yeah, it means an animal carcinogen, but no human data --

CHAIRPERSON ANASTASIO: Okay.

PANEL MEMBER BLANC: -- essentially.

CHAIRPERSON ANASTASIO: Okay. So carcinogenic in animals, no human data. Okay. Thank you.

DR. COGLIANO: Yeah. I used to work at IARC. It was, yeah, inadequate human evidence, sufficient animal evidence for this. And the label they put is possibly carcinogenic to humans.

CHAIRPERSON ANASTASIO: Okay. Thank you.

PANEL MEMBER BLANC: But it doesn't imply possibly carcinogenic to animals. It is carcinogenic to animals. That's how it got to be 2B.

CHAIRPERSON ANASTASIO: 2B, yeah.

PANEL MEMBER BLANC: So it's not inconsistent with the -- the California listing. In fact, it's consistent with it. It just happened slower.

CHAIRPERSON ANASTASIO: Right. Okay. Thank you.

Just one other question. I think it's just a statistics question. Back on slide 11. IT people, can we get to slide 11?

Just curious about the statistical significance

for the control. Can you just tell me conceptually what does that mean? It's statistically different from what?

DR. BUDROE: Okay. For slide 11, which would be the rat tumor incidence. By pairwise comparison, for example, take the female rat thyroid gland C-cell, adenoma carcinoma data all -- by pairwise comparison with controls using the Fisher exact test, all three dose groups had significantly increased tumor incidence compared to controls.

CHAIRPERSON ANASTASIO: Right. So that's for the exposed groups. They're statistically different from the controls. I'm curious about, the controls are also marked as statistically different and I don't understand that.

DR. BUDROE: That is a common convention -- it confused me the very first time I encountered it. And we're going to have to use different symbols I think. What that means is that there was a positive -- one asterisk would mean that there was a positive trend test for control significant at the P less than 0.05 level. And two would mean P less than 0.01.

CHAIRPERSON ANASTASIO: What's different from that?

PANEL MEMBER GLANTZ: Yeah. This is -- this is Stan

DR. BUDROE: So it -- it's we're kind of

conserving real estate there, but it would probably be a lot more -- it would be less confusing if we used a symbol other than an asterisk next time. So we can make that change.

PANEL MEMBER GLANTZ: Well, this is Stan. I was confused by the same thing. And I think what I suggested to OEHHA was that rather than having asterisks in the control column, that they add another column to the table that says, you know, was there a significant trend? Because all the other asterisks in the table represent comparisons against control. And, I mean, I was very confused by that. So I just think they -- you know, to get rid of the asterisks in the control column and add another column that says, you know, significant trend question mark, and then put the P values in there. I mean, it's buried in a footnote in two of the tables.

CHAIRPERSON ANASTASIO: Okay. Now I understand.

PANEL MEMBER GLANTZ: I didn't figure it out until I asked them. So that needs to be -- you know, it's just an editorial change. But since multiple people were confused by it, I think they need to make it.

DR. BUDROE: Is there any chance, that we could go to using a different symbol than an asterisk for the control column?

PANEL MEMBER GLANTZ: No. No, because -- because

the symbols -- the symbols -- the symbols in the table indicate significance testing of comparisons against control. And it just -- I don't know why you're so resistant just adding another column to the table. It makes it explicit about the trend test.

DR. BUDROE: Real estate conservation.

(Laughter.)

DR. BUDROE: We can -- we can make that change.

DR. COGLIANO: Yeah. We'll think about how to do that and be more clear in future documents.

CHAIRPERSON ANASTASIO: Beate.

PANEL MEMBER RITZ: I actually have another suggestion. I hate seeing P values less than. I would like a real P value, because a P value of 0.06 might be just as relevant as one of 0.04. And we don't see that here. And we have so few animals, that can easily happen and then something that actually is just as informative is called non-statistically significant and thrown around. So P values, please, if you want to list them at all, list the real P value, not a less than.

DR. BUDROE: Okay.

CHAIRPERSON ANASTASIO: There goes your concern about real estate.

(Laughter.)

CHAIRPERSON ANASTASIO: But I agree, it's very

helpful information to know if it's closed.

Ahmad.

PANEL MEMBER BESARATINIA: Yes. We have table 1 and table 2 in the report. And then we have an adjusted table listing the incidence of tumor in mice and rats. And I'm wondering, these absolute numbers and the percentages are indicated in the adjusted table. Are there any differences? Because it looks like, at the highest dose, there are some elevation in the number of tumors. There is a -- hardly see a trend and there is no statistics indicated for either table. The only thing that I came across is the table 8 in the report itself, which deals with modeling results. So I'm wondering if there hasn't been any data analysis once you adjusted this tumor incidence in the two models.

DR. BUDROE: All right. You're talking about table 8 in the document itself?

PANEL MEMBER BESARATINIA: Table -- actually, that would be table -- the adjusted table in the document.

CHAIRPERSON ANASTASIO: Sorry. Can I make a suggestion? I think the comparison may be slide 10 versus slide 23 for the mice -- the mouse example.

PANEL MEMBER BESARATINIA: Yeah, it's page 12 of the -- page 12 of this handout you gave us, which is slide 23 and slide 24. Page 13 of the handout.

DR. BUDROE: Right. We didn't do pairwise comparison or trend tests on the adjust -- mortality-adjusted. So is that something you'd like to see added to the --

PANEL MEMBER BESARATINIA: Yes, but -- because I'm thinking that your model is based on the adjusted number, isn't it?

DR. BUDROE: Right.

PANEL MEMBER BESARATINIA: Okay.

DR. BUDROE: Right. We kind of showed the unadjusted tumor incidence data first for the purposes of doing essentially hazard identification. This is, of course....., and then is there, you know, a positive, you know, dose response test for trend?

And then we could do pairwise comparison on the tumor incidence adjusted for mortality. We just didn't include that in the document. That would be useful. We could do that also.

CHAIRPERSON ANASTASIO: Yeah, THAT seems like a useful -- I mean, the denominator doesn't change that much, right, you'd lose one or two animals.

DR. BUDROE: Right.

CHAIRPERSON ANASTASIO: But it does seem like it would be a useful comparison to make sure they're still statistically significant.

DR. BUDROE: Right. And we wouldn't expect that there's going to be that much change, but something --

CHAIRPERSON ANASTASIO: Right.

DR. BUDROE: -- could -- one could drop in, and could drop out like that if you were --

CHAIRPERSON ANASTASIO: Right.

DR. BUDROE: -- on the edge of significance.

CHAIRPERSON ANASTASIO: Yeah.

PANEL MEMBER BESARATINIA: Because with the limited number of animal, quite a few can have an impact on your final P value when you're making such comparisons, so...

PANEL MEMBER BLANC: Yeah, but if I understand -- I was going to not go to this until we had the other discussion. But in terms of your expla -- detailing of the method of the adjustment, which therefore allows for fractional animals, because of the time, but all of these are even integers here in the denominators. Did I misunderstand something about the method?

DR. BUDROE: No. The reason you don't have integers in the poly-3 correct is because you would have fraction -- Essentially fractional animals in the denominator. We didn't want to make it overly confusing.

PANEL MEMBER BLANC: No, but this is a table of the adjusted incidence, right?

DR. BUDROE: Right.

PANEL MEMBER BLANC: And the adjusted incidence allows for having 48.6 animals. Did I misunderstand that?

DR. BUDROE: Well, this, for example -- the mouse tumor data was adjusted using effective number. So that allows for whole integers in the denominator. You wouldn't have fractionals. You only have that for a poly-3 correction.

PANEL MEMBER BLANC: I see. So this is the -- and the unit risk derivation was not using these data, but using the poly-3 data.

DR. BUDROE: Well, for the rat data it was.

PANEL MEMBER BLANC: I see. And this is the mouse data?

DR. BUDROE: Correct.

PANEL MEMBER BLANC: And therefore, the interpretation of this is that since we started with 50 -- let's go back for a second. Since we started with 50 in each group, so the implication here is that three dropped out, at some point? I mean, is that the correct implication of this?

DR. BUDROE: That would -- yeah, that there were three that died before the time of the first effective tumor.

PANEL MEMBER BLANC: Right. So, you know, just

to respond to your comment, it's such a small difference that I think it's actually pretty unlikely that even with relatively small numbers, unless they had something which was such a borderline relationship, prior to which addresses Beate's point, that if there was something that was 0.059, it might be, you know, 0.049 now, but it's unlikely.

And then the reason why the next slide is only as percentages is so that you don't confuse people with fractional animals, is that why?

DR. BUDROE: Correct.

PANEL MEMBER BLANC: If I actually did the algebra and multiplied that out, I'd come up with not whole integers.

DR. BUDROE: Correct.

DR. COGLIANO: Yeah. I used to do a lot this at the U.S. EPA. So, yeah, the previous one on the mice, it was basically the mice that died before the first tumor. Sometimes mice died within the first few weeks of a study --

PANEL MEMBER BLANC: Yeah, yeah.

DR. COGLIANO: -- which is not a -- and you're just removing them, because they lived so -- such a short life, they didn't have a chance for the tumor.

The poly-3 correction was actually I think in one

of the earlier slides. And it's basically that fraction of two years that the animal lived over the two years to the third power. And so when you take that fraction and put it to the third power, you're getting a non-integral correction. What that Basically means is that an animal that lived 12 months is going to contribute a little bit to the denominator.

PANEL MEMBER BLANC: But --

DR. COGLIANO: Whereas, the effective number, if you're taking the animals out before the first tumor, an animal that lived 12 months if the first tumor was at 14 months wouldn't contribute anything. So it's a slightly different way of making that adjustment. And with the poly-3, yeah, you end up with fractional numbers. And that's also confusing, so that's why this slide is expressed terms of percentages.

PANEL MEMBER BLANC: Percentages and not...

CHAIRPERSON ANASTASIO: Beate.

PANEL MEMBER RITZ: I mean, in the human analyses and literature, what we do is person time, right? So I don't know why you're not saying mouse survival time. That's a pretty simple way of getting at the denominator. That's actually correct.

DR. COGLIANO: Poly-3 is perhaps a bit simple -- more similar to person years than an epidemiology study,

but it is with a third power of the fraction of the lifespan correction, so it's still a little different. And that I think is from some of the earlier Armitage-Doll modeling that tumor incidence tends to go up at some higher power like three, four, five, sixth power of dose and -- or time. And so it was, you know, more than just the per -- the month -- the mouse months. It's --

PANEL MEMBER RITZ: Right, I do understand that. But as long as the mouse didn't have an event, it doesn't matter whether the mouse dropped out at age three months or 12 months, right?

DR. COGLIANO: In the effective number, it might not. If the first tumor was at 14 months, it doesn't matter if it dropped out at three months or 12 months. In the poly-3, three months would be, three out of 24 months to the third power, and the 12-month would be 12 out of 24 months to the third power. And a 12-month mouse would make a larger contribution to the denominator.

PANEL MEMBER RITZ: Okay.

CHAIRPERSON ANASTASIO: Okay. Thank you.

Any other questions on the presentation so far?

All right. If not, let's continue then with the response to public comments.

PANEL MEMBER GLANTZ: Actually -- actually, this is Stan.

CHAIRPERSON ANASTASIO: Yeah, Stan.

PANEL MEMBER GLANTZ: So I'd just like to -- so I'm -- so are you guys saying that you don't think the poly-3 adjustment was appropriate? I'm a little confused by the discussion.

PANEL MEMBER BLANC: Paul Blanc here. I wasn't suggesting that at all. I was just trying to understand which -- which slide applied to which -- which table. And -- and it helped clarify for me why one table had whole numbers, because it wasn't poly-3. It was the other way of doing it. And one table with the rats was presented -- presented in percentages, but that was to avoid confusing people with, you know, 47.4 rats or whatever it would have led to.

So I have no problem with them using what are accepted as standard approaches to these problems in the interpretation of small animal studies to derive risk estimates. So that was just for my own edification.

PANEL MEMBER GLANTZ: Okay. Thank you.

CHAIRPERSON ANASTASIO: All right, John.

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DR. BUDROE: Okay. During the public comment period, OEHHA received comments from the American Coatings Association.

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DR. BUDROE: And we've paraphrased the comments that were received in the interests of brevity in the presentation.

Comment number one, OEHHA incorrectly assumed the mutagenicity of PCBTF and employed this assumption to incorrectly support the use of a low-dose linear risk model.

And OEHHA used a technical approach that is inconsistent with U.S. EPA's 2005 guidelines.

Our response to this comment. OEHHA's decision to use the low-dose linear assumption for dose response modeling was not based upon an assumption that PCBTF is genotoxic or mutagenic, but instead upon the lack of information indicating that a nonlinear threshold modeling approach should be used.

In these situations, OEHHA uses a health protective approach that includes assuming low-dose linearity in the dose-response model.

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DR. BUDROE: Additionally, contrary to ACA's assertion, OEHHA's use of the low-dose linear risk model is consistent with U.S. EPA's 2005 guidelines on page 3-21, which state quote, "When the weight of evidence evaluation of all available data are insufficient to establish the mode of action for a tumor site and when

scientifically plausible based on the available data, linear extrapolation is used as a default approach, because linear extrapolation generally is considered to be a health-protective approach. Nonlinear approaches generally should not be used in cases where the modes of action have not been ascertained".

PANEL MEMBER GLANTZ: So this is Stan. I apologize. I can't -- I'm not seeing the slides again.

CHAIRPERSON ANASTASIO: We're seeing them, so I'm not sure if it's a webcast issue, but our crack IT staff is on it.

PANEL MEMBER HAMMOND: Yeah, I'm not seeing them either. This is Kathy. So I assume it't the web broadcast.

CHAIRPERSON ANASTASIO: John, I'm wondering if you have the slides and we could email to Kathy and Stan?

CHAIRPERSON ANASTASIO: Well, they're on that laptop. If they email to that laptop.

PANEL MEMBER GLANTZ: The slides just appeared.

CHAIRPERSON ANASTASIO: They appeared. Oh, perfect. All right. Thank you, John. Please continue.

PANEL MEMBER GLANTZ: I'm seeing slide 36 right now.

CHAIRPERSON ANASTASIO: Yes, that's right.

DR. BUDROE: Correct.

Okay. Comment number two. ACA Challenges OEHHA's assessment that the available genotoxicity data as providing quote, "some evidence", unquote, that PCBTF is a genotoxic substance. In particular, ACA criticizes the use of genotoxicity results obtained for unscheduled DNA synthesis by Benigni 1982 for sister chromatid exchanges, or SCEs, by Litton Bionetics 1979, and for micronucleus formation, NTP 2018.

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DR. BUDROE: Our response to comment number two was in Benigni 1982, a monotonic dose response for UDS was observed for concentrations between zero and two microliters per ml. A positive, but relatively decreased response to the highest dose, ten microliters per ml, may be due to cytotoxicity.

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DR. BUDROE: In the 1979 Litton Bionetics report, SCEs per chromosome in the non-activated test were significantly increased the controls at all tested concentrations of PCBTF, with t-test p-values of less than 0.01; and three of five tested concentrations with activation displayed elevated SCEs. And the chart up there on the slide shows the data from the non-activated SCE tests and indicates a clear dose-response trend.

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DR. BUDROE: And then finally, in NTP 2018, significantly increased micronuclei were observed in male mice. The NTP report states quote, "In mice from the 3-month study, small but statistically significant increases in micronucleated mature erythrocytes were seen at the highest exposure concentration(2,000 ppm)... For the male mice, the observed response was outside the historical control range for the laboratory and was therefore judged to be positive".

And I'd like to also note that the -- for female mice, there was also a statistically significant increase seen at the high dose. But that value fell within the historical control range for NTP and they decided it wasn't -- wasn't judged -- it was significant but not judged to be positive.

So based on the ACA's comment, OEHHA revised the wording of its conclusion in the document from "some evidence" to "limited evidence" that PCBTF is genotoxic.

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DR. BUDROE: Comment number three, ACA states that OEHHA hypothesized quote, "The generation of a reactive and genotoxic metabolic intermediate that could potentially be of concern in determining the mutagenic potential of PCBTF. However, the potential for a mutagenic metabolite is not supported by the available

evidence provided in table 4 of...", the document.

And our response to this comment is that although the mutagenicity data for PCBTF that's reported in table 4 of the document, including tests with metabolic activation, were uniformly negative, this does not invalidate the hypothesis that the metabolism of PCBTF, the phenolic compounds involves enzymatic oxidation of PCBTF's aryl ring, with a potential to form reactive electrophilic intermediates, such as aryl oxides quinones. These intermediates may covalently bind the cellular macromolecules including DNA.

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DR. BUDROE: Comment 4. ACA states that OEHHA did not conduct a proper assessment of the constitutive androstane receptor, or CAR, mode of action for mouse liver tumors, and that quote, "The available science for PCBTF is consistent when a mode of action(CAR activation) proposed by NTP for male mice liver tumors(the endpoint relied upon for the OEHHA recommended IUR). Further, tumors occurring by this mode of action in rodents are not REL rant to human health".

Our response is to that comment is that ACA is incorrect to say that NTP proposed a CAR-based mode of action. NTP only discussed some of the evidence indicating that PCBTF may be a CAR activator in rats and

mice. In the same report section, NTP also concluded that further mechanistic studies are needed to better understand [PCBTF-induced] hepatocellular carcinogenesis".

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DR. BUDROE: Additionally, it has not been adequately demonstrated that rodent liver tumor data from chemicals fitting the putative CAR adverse outcome pathway, or AOP, are irrelevant to human cancer risk. Similar recent studies -- several recent studies with CAR/PXR humanized or transgenic mice indicate that the induction of mouse and human CAR/PXR can produce similar responses leading to liver tumors.

And the evidence supporting the CAR MOA for PCBTF liver tumor formation in mice is incomplete. The main elements of the CAR AOP are:

Activation of CAR; altered expression of hepatic, CAR-dependent genes related to cell cycle control with CYP2B and CYP3A induction, increased liver weight, and hepatocellular hypertrophy; this is followed by increased mitogenic cell proliferation of hepatocytes; increased pre-neoplastic liver foci; and increased hepatocellular adenomas or carcinomas.

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DR. BUDROE: Although increased liver weight, hepatocellular hypertrophy, and liver foci were observed

in the NTP 1992 and 2018 mouse studies, OEHHA has not identified any published studies demonstrating that PCBTF activates CAR in mice or that PCBTF causes CAR-related altered gene expression, CYP2B enzyme induction, or hepatocellular proliferation in mice.

CAR knockout mouse studies should be completed that show that CAR activation is a required event for the induction of live tumors in male mice exposed to PCBTF.

And I'll also note that there was rat data that indicated that, for example, CYP2B enzyme induction, however there was no increase in liver tumors in rats.

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DR. BUDROE: Comment number five. ACA cites an unpublished 1982 epidemiological report of Occidental Chemical Corporation workers as providing evidence that PCBTF exposure in humans does not produce and increased risk -- increased rate of the tumor types observed in animals following exposure to PCBTF.

And our response to that comment is the workers in this study were exposed to approximately 80 chemicals, in addition to PCBTF, including known or suspected carcinogens such as benzene, trichloroacetic acid, trichloroethylene, perchloroethylene, lindane, mirex and asbestos.

Statistically significant increases in

respiratory system and stomach cancer were found in the study cohort. However, individual chemical risk could not be identified in the study to the lack of -- due to the lack of chemical-specific, worker, or workstation exposure data.

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DR. BUDROE: Had the workers in the study been exposed to PCBTF alone, the observed elevated rates of respiratory and stomach cancer would provide qualitative evidence of PCBTF's carcinogenic potential in humans. The fact that the elevated tumor types observed in humans were different than the types found in rodents exposed to PCBTF is not relevant, since tumor concordance is not generally observed across different species, nor is it required for cancer risk assessment.

Finally, given that plant workers were actually exposed to unknown concentrations of multiple potential carcinogens, including PCBTF, the study provides no useful information with which to assess PCBTF's carcinogenicity.

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DR. BUDROE: Comment number six. ACA stated quote, "OEHHA did not use generally accepted modeling approaches". Specifically, OEHHA relied upon draft 2014 BMDS guidance instead of U.S. EPA's prior final BMDS guidelines in 20 -- from 2012.

Also, that OEHHA only reported p-values to characterize goodness-of-fit and did consider Akaike's Information Criteria, or AIC, values. Thus, the fit of the models to the data has not been adequately assessed.

And our response to that comment is that OEHHA generally follows U.S. EPA guidance on the proper use of its BMD software. This includes the 2012 BMDS guidelines and the 2014 guidelines addendum. According to U.S. EPA, the 2014 guideline has been reviewed in accordance with U.S. Environmental Protection Agency policy and approved for publication.

OEHHA contacted U.S. EPA staff about the status of the 2014 guidance and they verified that it has been officially recommended by the Agency Statistical Workgroup for use in use in U.S. EPA risk assessments.

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DR. BUDROE: Additionally, ACA is incorrect that we only use chi-squared measures of fit, that is p-values, to judge the fit of the multi-stage models to the data. We also used: the scaled residual for the dose nearest the benchmark dose; visual inspection of the overall curve fit; and, AIC comparison when recommended by the 2014 BMDS addendum.

OEHHA also -- we also note that using the 2014 BMDS guidelines for male mouse liver tumors, upon which

the proposed IUR is based, produces the same BMDL value as used only to -- is obtained by using only the procedures contained in the 2012 BMDS guidelines.

Now, in response to those comments, we have added a column to table 8 of the IUR document indicating cases in which the AIC or an alternative method was used to choose the model for each tumor site. We also provided text to the model calculations section of the document describing the reasons for those choices.

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DR. BUDROE: Comment number 7. ACA states that quote, "The method OEHHA used to adjust for differential early mortality or significant differences in survival is a crude approach and is not recommended in either the U.S. EPA 2005 guidelines for carcinogen risk assessment or the OEHHA 2009 technical support document. Rather, the application of time-to-tumor models are noted in both guidance documents to account for significant decreases in survival. And therefore, currently accepted scientific approaches were not relied upon to adjust for survival".

And our response to these comments are that OEHHA used two standard methods to adjust tumor-incidence data for differential early mortality in the animal studies. The effective number method was used for mice and the poly-3 method was used for rats. These methods, which are

described in more detail in the IUR document, have been used regularly by OEHHA, U.S. EPA, and other risk assessors.

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DR. BUDROE: ACA stated that the effective-number and poly-3 methods are not recommended in either U.S. EPA 2005 or the OEHHA 2009 TSD. More precisely, these methods are not directly addressed in the guidelines.

Both OEHHA and U.S. EPA guidelines present time-to-tumor analysis as an option, not a requirement, that may be used when survival is poor in some dose groups, and when the appropriate information to run the model is available.

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DR. BUDROE: Comment number eight. ACA notes quote, "PCBTF was developed as a substitute for use in ACA member products precisely because it assists in reducing the public health effects of ground level ozone. Currently, there are no viable alternatives available to replace PCBTF where it is used as an exempt solvent... Overregulating this chemical to avoid an uncertain hazard, that is potential health effects in humans will only bring about the near certain public health impacts of increased ground-level ozone".

And our response to this comment is that the

comment is relevant to risk management of chemicals subject to the hot spots regulations. OEHHA is responsible for developing risk assessment guidelines, including IURs, for hot spots facility health risk assessments, but is not generally responsible for risk management activities, resulting from hot spots risk assessments. Such responsibilities are the purview of the California Air Resources Board and the regional air quality management districts.

And that concludes the response to comments presentation.

CHAIRPERSON ANASTASIO: Great. Thank you, John.

I think in the panel discussion, we'll probably touch on some of these public comments and the response, so let's not have questions specifically about the response now. We'll do that as part of the panel discussion.

I do want to make one note, we received comments from two organizations in the last ten days, but that's not sufficient time for OEHHA to address them. So, John, I would ask that you guys assess those comments and perhaps report to us at our July meeting on your response to those comments. Will that work?

PANEL MEMBER GLANTZ: Well, this is Stan. You know, I -- I mean, I don't know how the discussion of the

document as a whole is going to go, but, you know, I find it quite objectionable to get these last second comments in a time that, you know, precludes OEHHA from responding and then us from considering the responses.

And, you know, I would -- you know, depending on how the discussion goes today, you know, if the committee, you know, feels the document is good enough to approve, I don't think we should delay it till July, you know, just because these comments came in so late.

I mean, I read them, but -- I mean, we did, once upon a time, basically have a policy that to be considered, a comment had to come in, I think it was, a month before the meeting or three weeks before the meeting to avoid just this problem. We've gotten kind of sloppy about that. But I actually think we should reinstate a formal policy that we should -- in order to be considered, comments need to come in far enough in advance to allow proper consideration.

I mean, if the committee decides the report needs so much work that it will have to come back in July, then I'm -- I think it's -- you know, there's no reason not to discuss the comments then. But about would hate to allow this kind of sandbagging behavior to delay a decision on a document that's otherwise warranted.

PANEL MEMBER BLANC: I concur. So I suggest we

defer how we handle in a formal way the comments that were received too late for review, until after we do everything else.

CHAIRPERSON ANASTASIO: Okay. I think that's reasonable. I'm looking over at Lori now. So, Lori, what is our -- do we have some guidance for commenters in terms of when we need to receive it in order for it to actually be considered by the Panel?

PANEL LIAISON MIYASATO: It hasn't actually been put in the public announcement. We usually give about two weeks. We ask for the comments two weeks beforehand, but it wasn't written into this public notice.

CHAIRPERSON ANASTASIO: Oh, I see. Okay. And, John, is two weeks generally enough time that OEHHA could respond?

DR. BUDROE: That would be about the bare minimum. I mean, it depends on the length of the comments and the technical complexity.

CHAIRPERSON ANASTASIO: Yeah. So Lori, is there --

PANEL MEMBER GLANTZ: Yeah, but the -- but -- well, but the -- but the point is it's not just OEHHA responding, it's us getting a chance to read the responses and think about them before the meeting. So, I mean, I think we should -- I mean, I, you know, participated as a

commenter in many other government dockets. And, you know, the dockets typically close, you know, reasonable time before the meeting.

And, I mean, the fact is whatever the last minute is, that's when they'll come in. And I think we -- I mean, we can come back to this at the end of the meeting, but I personally think that we ought to have a deadline for comments of a month before the meeting, which would give OEHHA a couple of weeks to respond, and then -- so we would get the stuff in enough time to actually read the comments, and responses, and think about them, and have an intelligent discussion, rather than getting kind of sandbagged like this at the last second.

So, I mean, we did actually do that once upon a time, but somebody said, well, we shouldn't tell people they can't send comments in. But, I mean, these last minute -- I mean, in addition to the ACA one, a couple came in just a couple days ago. I'm actually on vacation right now and, you know, having to plow through last-minute comments when OEHHA doesn't have a chance to respond is just -- it just -- it's a perversion of the whole process.

We can come back to this. But I feel quite strongly that we should not let people come in with these last-second comments where nobody has time to really think

about them.

CHAIRPERSON ANASTASIO: Yeah. I think the entire panel agrees with that assessment, Stan. And so I'm looking to Lori now. Lori, do we have the ability to set a deadline that -- if comments are to be considered, that they need to be in say a month before the meeting?

PANEL LIAISON MIYASATO: We can try to do that. The thing is we only posted the public notice a month before the meeting. And so we'd have to speed up the entire process, which means the program staff as well would have to get all the materials together and know what the agenda is going to be for the meeting. So that means everyone is going to have basically speed up the process. We can try to do that earlier, but that would also depend on the program leads.

PANEL MEMBER KLEINMAN: This is Mike. I thought that when the documents are released for public review, there is some statement in the release note that comments will be, you know, accepted up to a certain point.

DR. BUDROE: Well, the documents are commonly released for public comment for a 45- or 60-day period or, you know, longer. But the -- when the documents are released to the panel, they're commonly been released 30 days upfront. And these comments that are coming in essentially are comments on the revised document. So

there's not really a public comment period at that point, but you're still getting public comments.

CHAIRPERSON ANASTASIO: Okay. So I suggest that I discuss this with agency leads at our next kind of Chair's meeting and try to see if we can't come up with a process that makes this better for the Panel and makes it better for the agencies.

PANEL MEMBER GLANTZ: Yeah. I just -- I don't want to beat a dead horse here, but I mean, I don't have any problem with giving the public an opportunity to comment on the revised document. But it just has to be -- you know, they -- it has to happen in enough time that it becomes a meaningful part of the discussion.

PANEL MEMBER BESARATINIA: Well, if the document is posted one month in advance of the meeting, so it's only understandable that they are responding two weeks after or three weeks after. So there should be some sort of reorganization here.

PANEL MEMBER GLANTZ: Well, maybe -- I don't want -- we should get back to the document. Maybe the document should be posted six weeks before the meeting or something. And then -- and then, you know, then -- and people would have two weeks to put comments in. And that would then give OEHHA time to respond and us time to think about the responses. I mean, we don't want -- but we

don't want this to become an infinitely recursive process.

CHAIRPERSON ANASTASIO: Yes. I think we all agree with that.

Okay. So that brings us to the end of the OEHHA presentation.

DR. BUDROE: Yeah, if I could beg the Chair's indulgence for a five minute break.

CHAIRPERSON ANASTASIO: Yeah, I was just going to suggest we're going to take a five-minute break now. And then we'll come back and the leads will start the discussion of the document, and then we'll have a chance for the Panel to weigh in.

All right. So we'll reassemble in five minutes.

(Off record: 10:49 a.m.)

(Thereupon a recess was taken.)

(On record: 10:57 a.m.)

CHAIRPERSON ANASTASIO: Hello.

Okay. Kathy and Stan can you hear us?

Kathy and Stan, are you with us?

Well, let's give them another minute or two.

PANEL MEMBER HAMMOND: Is that right.

PANEL MEMBER GLANTZ: Yeah. This is Stan is here too. I was just across the room.

CHAIRPERSON ANASTASIO: Okay. Great. All right. We are all reassembled, so we're going to begin. So

this -- the two leads for this document were Dr. Joseph Landolph and Dr. Lisa Miller.

And Dr. Landolph is going to start us off.

PANEL MEMBER LANDOLPH: Okay. Thank you. I read the document carefully a number of times and I wrote myself a critique on it just so I had some notes to read off.

I thought the document was scientifically accurate and very well written. Clear to me the authors did a very good job writing the document and the reviewers have done a good job reviewing it. There were no typographical errors in it. This authors of the document answered all of the comments of the coatings manufacturers appropriately, in my opinion. The authors invested a lot of time and effort into answering the comments of the coatings group.

My specific comments were the introduction was fine, well-written, clear -- clearly stated the purpose of the document. They described what PCBTF was used for, it's various uses and its air emissions and exposure potential. They looked through the noncancer effects and capsulized them.

And they noted that no studies on the noncancer toxicity of PCBTF to humans were found in the peer-reviewed literature. And they said no studies of the

noncancer -- I'll skip that.

Next, they discussed that OEHHA found four published reports evaluating the subchronic/chronic noncancer effects of PCBTF exposure in mice and they discussed those in great detail. And then they went to the cancer risk assessment document itself as prepared for PCBTF. And they went through that in excruciating detail and listed all the physical and chemical properties of the compounds and how they calculated the cancer slope factor and inhalation unit risk in great detail. And it was very clear to me how they did this. So that was fine.

They reviewed the information on the absorption, distribution, metabolism, and excretion of PCBTF in mammals. Although, this data, they pointed out, was somewhat sparse. They noted PCBTF is really absorbed orally and by inhalation, widely distributed throughout the body with a tendency to concentrate in fat and fatty tissue. Primarily excreted unchanged via inhalation, secondarily metabolized by aromatic hydroxylation and excreted through urine and feces as conjugated phenolic compounds; and converted into small amounts of mercapturic acid metabolites.

They went over the genotoxicity as it exists in great detail. And they showed it was negative in the Ames reverse mutation assay in four studies with and without

metabolic activation, negative and forward mutation in salmonella typhimurium, and negative and forward mutation in L5178Y mouse lymphoma cells with and without metabolic activation. They noted that it did not induce mitotic recombination in A. nidulans. And they reviewed that it does induce sister chromatid exchange in L5178Y mouse lymphoma cells, both with and without S-9 metabolic activation.

They noted that PCBTF does not induce chromosomal aberrations in Chinese hamster ovary cells with or without metabolic activation. They also noted that it does not induce chromosomal aberrations in vivo in Sprague-Dawley mice or female rat bone marrow assays without S-9 metabolic activation. And it did not induce micronucleus formation in vivo in Sprague-Dawley male or female rats peripheral blood, but does induce micronucleus formation in vivo in B6C3F1 mice and female mice and peripheral blood without S-9 metabolic activation.

So I agreed completely with their assessment of the genotoxicity. It was balanced and there is some, but a limited amount of genotoxicity studies. So I agreed exactly how they characterized it.

And they went through the cancer hazard summary very well and a quantitative cancer risk assessment. And they presented their results from calculating the human

cancer slope factor from the animal cancer slope factor, which in turn was calculated from the animal BMDL. And that was all very straightforward and transparent to me.

In a separate document, the authors also replied very carefully and completely, in my opinion, to the criticisms of the ACA of their cancer inhalation unit risk factor document for PCBTF. I was satisfied that the replies of OEHHA to the ACA's comments were scientifically correct and explained carefully what we had done in constructing this document and why.

I also agree with OEHHA that the use of linear no threshold dose response for carcinogenesis induced by PCBTF in male and female mice, and in male and female rats was correct as they justified it, which means basically that nobody really understands the mechanism. We need a whole research project to ferret that out and that data is not available now. So it's correct, when you don't know the mechanism, to use the default linear, no threshold dose response curve for carcinogenesis.

So overall, I thought this was a very good document. I compliment the -- Dr. Budroe and his colleagues and the co-authors on the construction of the document. I think it's a fair document. It's well rationalized. And I agree with the conclusions in the document and their conclusions as they replied politely

and carefully to ACA.

CHAIRPERSON ANASTASIO: All right. Thank you, Joe.

Lisa.

PANEL MEMBER MILLER: So I don't have a lot to add to Dr. Landolph's very comprehensive review.

I found the science associated with the animal studies to be very compelling. And it certainly was supported by the NTP document, in the fact that that document cleary went through peer review, through the NTP, and I -- I actually went through the meeting minutes and notes, and it was a unanimous approval from their perspective. So I think that adds weight to the animal data presented here and used here. So I think that's appropriate.

My only comment, and this is, you know, coming from somebody who does more translational -- I guess I would say translational work. The lack of data from -- or the limited, I should say, not complete lack, but limited data in human subjects could be perceived as problematic. And it's likely that we just haven't looked carefully enough or we haven't had the opportunity to look very specifically at exposure, whether it's occupational or non-occupational. And I think where -- and this just could be a minor edit in the document to simply strengthen

the argument of why this is so important.

I noted in the paragraph where you indicate major sources in uses of PCBTF, and it -- and you mentioned the total production and import of PCBTF in the U.S. from -- ranged from 5,000 to 25,000 tons per year. And -- and in looking at the NTP document, they used two ranges. And I can't remember, off the top of my head, what those numbers were. But it almost sounded like the levels were going down in terms of usage. And I suspect that's not the case. I think it would be helpful if that info -- if this information is available to you is to provide some clarity on whether the use of this solvent is actually going up.

And I think that the fact -- if, in fact, you can -- you can clarify that, yes, this is a -- this is a chemical that's -- that is likely to be used. And the use is going to potentially be increased over time, thus adding to the concern that this could increase exposure levels to the human public. I think if you can identify or find that information and put that into your introduction, I think it would strengthen it.

And again, it just -- it increases the concern that the exposure levels to the human population could be high, and could increase with time, thus adding to the concern that the findings in the animal studies would def -- could potentially translate into the human

population.

So that -- that's -- that is my only major comment that I had is to -- to enhance or strengthen the introduction, so that it would have a great -- it could -- it would have a greater impact on the potential concern for this chemical in making it back to human pop -- the human population.

CHAIRPERSON ANASTASIO: Thank you, Lisa.

So related to that, John, do you have a sense of whether use is increasing?

DR. BUDROE: We do not, because it's -- there's remarkably little information about the use of the chemical certainly in California. In fact, it's not currently on the hot spots inventory emissions -- emissions inventory list. It's actually been proposed to be added to the list. And the panel I think has heard about -- I believe that will be the afternoon's discussion. So -- but it's -- we would like to put the information there. But if nobody is generating it, you know, you -- you're kind of stuck.

So it's -- I get the sense it is certainly still important in use in California, given its use in things like paints, and metal cleaning, and such, so -- but it is important. It's worth doing the cancer potency for it. Whether use is going up, down, or staying the same, we

don't have a handle on it. Although, Dr. Anastasio did provide us with a reprint that we'll be using when we revise document post-meeting regarding PCBTF concentrations in urban air. And we will include that in next revis -- next document revision.

PANEL MEMBER MILLER: That would certainly strengthen the document. I was not aware of that. Was that a recent publication?

CHAIRPERSON ANASTASIO: Yeah, I think it was in the last year.

PANEL MEMBER MILLER: Okay.

CHAIRPERSON ANASTASIO: Yeah.

Yes, Joe.

PANEL MEMBER LANDOLPH: Just a quick addendum comment, particularly since Dr. Cogliano is here. You know, the ACA tried to really provide evidence for a threshold. And as far as I'm aware, I've not seen anything regulated as a threshold carcinogen yet. I know the EPA tried TCDD thinking that that would be, because it bound to a receptor. And the modeling showed that that was linear, no threshold.

So I don't -- I'm not aware of anything that's been regulated by a threshold yet. Are you?

DR. COGLIANO: There are very few. I think chloroform at the U.S. EPA was considered to be a

threshold, where the carcinogenicity was secondary to cytotoxicity, at which you find that threshold dose. But I mean, that might be the only one I can think of out of really hundreds of chemicals. And you really do need a large amount of mechanistic evidence to be able to really feel confident with a threshold.

And when I looked at the dose response curves for this chemical in rats and mice, there certainly doesn't seem to be any evidence of low, low, low, and then going up at the high dose. It really seemed to be going up at the mid -- at the mid-doses as well.

So I think that it's rare to find a threshold. And I think, in this case, there really doesn't seem to be evidence that would push you towards a threshold.

PANEL MEMBER LANDOLPH: Yeah. My impression is the same. And I think if they were going to use the CAR model, a heck of a lot more data has to be produced. That's not accepted either. That is just not enough data.

CHAIRPERSON ANASTASIO: Thank you, Joe.

So I open up to the panel now. Let's tart with our remote participants.

Kathy, any comments?

PANEL MEMBER HAMMOND: No, thank you.

CHAIRPERSON ANASTASIO: Okay. Stan?

PANEL MEMBER GLANTZ: No, I -- this is -- I think

it's been a good presentation. I really appreciate the review of the two panel leads. I guess the one thing I would add -- and I did carefully read the ACA letter of February 18th and was sort of looking through it as John was making his presentation and the response to comments. And, I mean, it would have been nice to have had a formal response to this letter. But I didn't see anything new in the February 18th letter that John didn't address in response to the previous letter.

And in hooking at the February 26th letter from the Roof Coatings Association, my sense of most of what they were talking about dealt with risk management not -- rather than risk assessment. So I that be worth just noting that. But no, I -- I don't have any other comments beyond what I already said.

CHAIRPERSON ANASTASIO: Okay. Thank you, Stan.

Other Panel members?

Beate, do you want to go first?

PANEL MEMBER RITZ: Yeah, I have two things. One, I really appreciated that you were referring to the noncancer effects in the preliminary introduction. And I just would recommend when you're looking over those, it's very clear that they actually are seen in the same organs with see the cancers in. And some of those changes could actually be seen as pre-carcinogenic lesions. And it

seems from the write-up that there -- that these were actually seen at subchronic and chronic dosing.

So maybe some -- different from the cancer effects. But I don't know whether there is any way to state that a little more clearly, that this is actually relevant. It's also relevant to the argument that there is a threshold, right, for carcinogenicity. If these are pre-cancerous lesions, then that underscores that there's probably not a threshold. We just need to wait long enough and the cancer will come, if you get old enough. So that was one comment. Maybe you can see whether there's any wording or any -- you know, anything you might want to change or dare to change in that introduction.

And one more question. The Kaplan-Meier survival curves that are in the appendix, clearly they say probability of survival. And is that really what is shown here, not events, right? It's the survival of the animal, it's not the -- the cancer events. Because you can use these curves for anything, right? You can show mortality on the onset of the event.

DR. BUDROE: Right. That does -- that --

PANEL MEMBER RITZ: Page 30.

DR. BUDROE: Those graphs do show the survival curves. They're note --

PANEL MEMBER RITZ: They're mortality.

DR. BUDROE: Right.

PANEL MEMBER RITZ: I think that just needs to be added, because it could be events, and then you wonder which events, which cancers, like liver cancer or something. But if it's mortality of the animal, it should just be stated more clearly.

DR. BUDROE: Okay.

PANEL MEMBER RITZ: And then it's actually really amazing that the rats seem to be dying off quite early in these exposure studies compared to the mice. They have a pretty steep mortality.

DR. BUDROE: More so. Yeah, and that's why we wound up having to use the --

PANEL MEMBER RITZ: Right.

DR. BUDROE: -- the poly-3 correction on them.

PANEL MEMBER RITZ: Yeah.

CHAIRPERSON ANASTASIO: Thank you, Beate.

PANEL MEMBER RITZ: That's it.

CHAIRPERSON ANASTASIO: Mike.

PANEL MEMBER KLEINMAN: Yeah. On -- this is Mike. On the question of the possibly carcinogenic or genotoxic oxidation products, would it help -- you -- I don't know if you actually ran the PBPK model to see what concentrations you might see in the liver of these oxidized compounds, but it might be useful to be able to

say there is a non-zero amount of this material that could be produced in the liver through C4 -- cytochrome P450.

DR. KLOC: Let's see, it's been a while since I -- we did -- we actually did set up the model, to the extent that we could, based on the papers that we had. And it's -- it was done in the very early part of this analysis, so I'm a little rusty on it. But I'm -- I'm not -- I'm not so sure that the model was capable of calculating metabolites. I think it was mainly focused on the parent compound and concentrations of the parent compound in various organs.

PANEL MEMBER KLEINMAN: Oh, because it -- at least in the write-up, you have on -- in the slide show, it said that there was metabolism represented in the model. So I thought maybe it would actually give you some output.

DR. KLOC: I think the -- as I remember, and I have to go back and double check this, but I think the metabolism was used in order to subtract away from the parent compound in order to get a steady -- steady state concentrations, or actually non-steady state concentrations.

In other words, you know, you -- the model basically considers the intake of the parent compound and its breakdown in the body in order to come up with a

concentration at any particular time. We can -- we can go back and look at that.

PANEL MEMBER KLEINMAN: Yeah. I'm just thinking that it takes the teeth out of the argument that you're putting in something that's mythical, as opposed to there is a finite probability that there is something there.

DR. BUDROE: Okay. We can go back and look and see if the model would lend itself to doing that.

CHAIRPERSON ANASTASIO: Joe.

PANEL MEMBER LANDOLPH: Was there anywhere in the literature, any suggestion that people had shake -- incubated the compound with S-9, and DNA, and looked to see whether there were any DNA adducts or whether there were any oxidative stress fluxes generated?

DR. BUDROE: No. That kind of data is -- it's a data gap.

CHAIRPERSON ANASTASIO: Ahmad.

PANEL MEMBER BESARATINIA: I'm wondering if you can comment on the carcinogenic potential of this chemical relative to other known or suspected carcinogens? As I understand, in the rodent tumor tumorigenicity experiment, nearly 40 different anatomical sites were examined for tumor formation upon on necropsy, of which only liver in both male mice and rats showed signs -- positive sign of tumor formation.

And in female, one or two, mostly at the highest dose, yielded tumor. I'm wondering, in your judgment, would you ascribe this effect to site specificity of this chemical to induce tumor, or alternatively this chemical being a weak tumorigenic agent or a combination of the two?

DR. KLOC: I'd have to think a little bit about that.

DR. BUDROE: I wouldn't say that there is a great deal of site specificity with regard to PCBTF. I mean, there is for -- obviously for the mice. But for the rats, there's enough varied organ types that are being affected that you're not seeing a lot of site specificity there.

PANEL MEMBER BLANC: Can you clarify in terms of the gland that was highlighted in that regard specifically?

DR. BUDROE: Well, harderian gland.

PANEL MEMBER BLANC: Yes, harderian.

DR. BUDROE: Uterine, thyroid -- thyroid gland.

PANEL MEMBER BLANC: Harderian. Yeah. Yeah. SO for those of who treat humans, can you clarify what a harderian gland is? Because humans don't have one.

DR. BUDROE: Have one.

PANEL MEMBER BLANC: I don't know. It's not a socratic question I have.

DR. COGLIANO: It's a gland that does not have a direct counterpart in humans. So, yeah, its relevance is sometimes debatable.

Now, if you had a genotoxic compound which caused cancer, there you would say, well, you know that tumor it probably was through a genotoxic mechanism. But in this case, it's -- that's un -- yeah, it's really uncertain what the relevance of the harderian gland tumors are. You do have the liver tumors that are strong. And in the rats you have several hormonal related cancers. You have your uterine. You have the thyroid cancers, and -- yeah, those two.

So I would basically make -- I mean, I think the judgment here, the unit risk is based on the liver tumors. It's not based on the harderian gland tumors.

PANEL MEMBER BLANC: No, no. I understand that. I'm just -- was just stimulated to make that comment, that it wouldn't be absurd to insert a parenthetic the first time you refer to those tumors to say this is a rodent tumor that doesn't have a human corollary.

DR. BUDROE: Right. Just kind of specify what that -- what a harderian gland is. And this is rodent specific.

PANEL MEMBER BLANC: Right

DR. COGLIANO: That's a very good suggestion and

I think we can try to do that.

DR. BUDROE: We can do that.

CHAIRPERSON ANASTASIO: Okay. So sorry, can you -- I think Ahmad's first question was how does the cancer potency factor of PCBTF compare to some other carcinogens, you said? Can you speak a little bit about that?

DR. BUDROE: Not having prepared a list of where it is in the -- you know, compared to benzene or tri -- you know, hexavalent chromium and such, my sense was that it's not overwhelmingly potent. It's more potent, I believe, than, for example, tert-butyl acetate was that the panel considered awhile back. But it's less potent than say 1,3-butadiene. And to make a more detailed comparison, I don't have the information in front of me.

CHAIRPERSON ANASTASIO: Okay. Thanks.

Paul, comments?

PANEL MEMBER BLANC: Yeah. I mean, but that wouldn't be an absurd edit to consider, as in your discussion. You know, this is -- this is a cancer potency factor, which is well within the family of cancer potency factors typically arrived at. It's not at the extreme end in either way, something like that.

DR. BUDROE: Kind of a point of information item if there.

PANEL MEMBER BLANC: Yeah.

DR. BUDROE: Just this is where here -- here's a number of other unit risks and this is where PCBTF falls.

PANEL MEMBER BLANC: Without killing yourselves, just, you know, a little bit.

So I -- I agree with -- certainly, with the main lead comments. I think there were two issues here, one was a sort of weak attempt to bring into question the carcinogenicity of the compound. Although, I believe that the people that were doing the -- this is about the critiques -- the main critique, but I think they realized that was not a fight they were going to win, so they didn't pursue that. It was a sort of subtle implication.

And then the issue about using a -- some kind of nonlinear response, you're not -- nonlinear modeling, I fully agree that you responded to the comment. And that in the main document, that was the appropriate way to do it. And if you hadn't done that, you would have gotten a lot of grief from this Panel, I'm sure.

So the other comments I have are -- none of them are particularly cogent. A very small one is in your model of the metabolism, which is derived from obviously other sources where there are three pathways and one of them is, I think, glucuronidation and two of them are mixed function oxidase CYP. I assume that the document

you based that on doesn't specify which CYPs they are.

DR. KLOC: Yes, that's correct.

PANEL MEMBER BLANC: So I would also, I think, like a little parenthetical that you can't specify which they are. Otherwise, it doesn't make sense to have -- well, actually, how do you know they're two different CYPs, if you don't know what they are? Why are there two arrows? Because it's going to two different metabolites, so presumably they're two different CYPs, is that the story?

DR. KLOC: No. We didn't -- we didn't intend that to be the implication. We were just trying to say that the CYP system, meaning all the various different isoforms, and one of them -- some of them, which we -- we're not sure which ones are acting, can produce either one pathway, or the other, or both.

PANEL MEMBER BLANC: Well, I think it would be good to have a little parenthetic that says that too, because otherwise it's like why do you have -- you know -- or you're trying -- you know, in other words, it's to tell the reader we realize that there are specific C -- you know, CYPs and we're just using it, but we don't actually have the data to specify.

DR. BUDROE: Right. We can add that.

PANEL MEMBER BLANC: Right.

And then can I ask another thing which touches on both the parent document and the response? When you use data that you refer to as unpublished, which the term -- you use that term in several places, what does unpublished mean to you when you say that?

DR. BUDROE: Oh, for example, the Litton Bionetics genetox data?

PANEL MEMBER BLANC: Yeah.

DR. BUDROE: Yeah. That was an unpublished industry report that we got. I believe we got it from U.S. EPA.

PANEL MEMBER BLANC: And then you cited in the references, as the report, it's in the reference list, is that -- is that what the means?

DR. BUDROE: Correct

PANEL MEMBER BLANC: All right. So this is not specific to this document, but -- unpublished -- when I see the word unpublished, I actually wouldn't even necessarily look for it in the reference list. I would think it was a personal transmission of some sort. You're saying it was not -- you mean, it wasn't -- it was an industry report, which wasn't published in the peer-reviewed literature, is what you mean you?

DR. BUDROE: Correct.

PANEL MEMBER BLANC: So I think we need different

wording to make that clear, because there is a document. You have the document. It wasn't a personal communication, right?

DR. BUDROE: Right. We could put something in there like non-peer reviewed.

PANEL MEMBER BLANC: You could say non-peer-reviewed industry document, whatever it us you mean. Because otherwise, I'm looking for where -- you know, was it a personal communication or is it something you got from a Freedom of Information Act, right? It actually was published in a sense, or, you know, it was promulgated in someway. So that's just a very minor point.

DR. BUDROE: We can clarify that.

PANEL MEMBER BLANC: Yeah. And that will come up in other documents. It struck me for some reason more prominently here, because it was addressing important issues of data.

And then the final question I have for you is, you know, when you look up this chemical just online, there are some analogs to it, right? There are some related chlorobenzenes with -- without the fluorine on the carbon, or with only two fluorines, or are -- well, it's a question. Are there? It seemed to me they -- there is one compound that gets mentioned. It mentions a kind of

similar type material. Are you aware of that at all? Because if that's true, it amplifies your comment about how important is this chemical?

So I'm just curious, is this one of a family of similar esoteric solvents. And these are all solvents, is that correct? None of these are -- it is -- it is also used as an intermediate in the manufacture of selected herbicides, or pesticides of some sort. But in most of the uses we're talking about is just purely as a fancy solvent, not as an intermediate that polymerizes, or binds, or does something else?

DR. BUDROE: Right. The importance for California is going to be pretty much its use either in things like brake shops or someplace where they're using it as a solvent for metal cleaning or it's going to be in paints, inks, coatings --

PANEL MEMBER BLANC: As a solvent.

DR. BUDROE: -- as a -- well, as a carrier. So not -- I mean, in terms of actually formulating the paint.

PANEL MEMBER BLANC: But then it evaporates off.

DR. BUDROE: Right.

PANEL MEMBER BLANC: It doesn't polymerize.

DR. BUDROE: No, it's -- it evaporates off and leaves the solids and the coating --

PANEL MEMBER BLANC: Right. Does it -- when you

said it has a moderate vapor pressure, at one point in the physical description, I kind of underlined it for myself, because I wasn't impressed it was very volatile at all, based on that vapor pressure. So I was wondering was that -- your use of the term "moderate" was based on a standard criteria for what counts as moderate?

DR. KLOC: I think it's vapor pressure is somewhere between toluenes and xylene.

PANEL MEMBER BLANC: Oh, really?

DR. KLOC: Yeah.

PANEL MEMBER BLANC: That's -- that would be -- are you sure? That would be pretty --

DR. KLOC: I'd have to double check. That was something I was reading earlier on in passing. But I remember seeing -- I remember being somewhat surprised about that.

PANEL MEMBER BLANC: I think that would be easy to clarify. And again, it plays back to this question of how -- okay. This is an exercise that we had to go through because it got listed as a -- you know, a Prop 65 carcinogen, and therefore -- and there was some use in industry and so forth versus this is kind of a sleeping, underrecognized issue. And that case is not very well made in the document.

Now, it's not your obligation necessarily to

argue that, but it would be nice to have a little bit more context.

DR. BUDROE: Well, we did -- we actually started the cancer -- this document request of the South Coast Air Quality Management District. And it's important to them, in terms of the -- being a VOC-exempt chemical. So PCBTF has been granted a VOC exemption for certain rules, where they have -- you know, South Coast has VOC limits on products that are sold down there. And PCBTF gets a pass on that --

PANEL MEMBER BLANC: Right.

DR. BUDROE: -- but it has to be relatively nontoxic. And this got raised as soon as the NTP study got -- came out. It got raised as an issue with South Coast. And they in turn raise it. They formally asked us to evaluate the carcinogenicity of PCBTF, so --

PANEL MEMBER BLANC: When it was evaluated and put on the list, Prop 65 list or did they formally ask you to do this risk assessment?

DR. BUDROE: Well, it -- they asked us to enter it into the Hot Spots Program.

PANEL MEMBER BLANC: Okay.

DR. BUDROE: So -- and --

PANEL MEMBER BLANC: And to enter it in the Hot Spots Program, you need this document?

DR. BUDROE: Right, to produce this.

PANEL MEMBER BLANC: Right. So I -- that's very helpful. And I wonder are you allowed to put some of that in your introduction?

DR. BUDROE: We -- well, there wouldn't be any reason we couldn't put the fact that South Coast had asked us to produce this document into the introduction. We can do that.

PANEL MEMBER BLANC: Because it's a -- otherwise was exempt from the VOC -- I mean, this has been a -- this has been a recurring problem with very highly toxic solvents, which go into commercial appeal, because they don't -- they don't count for VOCs or they don't count for as a greenhouse gas, you know. And so I think whatever extent you're allowed to make that point, I don't think you -- you have to scientifically, but I think it's nice context.

And returning again to the solvent issue, I think it's very possible to read this and not understand that this is a solvent, or carrier, which by its technical, is only tech -- used technically, so that it can off-gas.

DR. BUDROE: Okay. So just making --

PANEL MEMBER BLANC: If -- can somebody else jump in here? Am I making the point that --

PANEL MEMBER LANDOLPH: I don't know if I would

amplify your point or make another one, but I would just say maybe get rid of the moderate and just say it has a -- it has a volatility on the order of benzene and toluene, BTEX, you know, which is a typical petroleum solvent that boils around 78 degrees, or something like that. That just get rid of moderate and just say similar to BTEX components, and you're -- you can get rid of the rest of it.

PANEL MEMBER GLANTZ: Hi. This is Stan. I -- I found this discussion that Paul made very enlightening, because I have to say when I was reading the document, I couldn't quite figure out why you were bothering with it. And I think adding that in the kind of preparatory material will do a lot to help put the document into context.

CHAIRPERSON ANASTASIO: Yeah. And essentially, all the PCBTF in the application is expected to go into the atmosphere.

DR. BUDROE: Correct.

CHAIRPERSON ANASTASIO: Right. There's no reaction as Paul was asking about. It's strictly a carrier, as you mentioned, of the non-volatile components of the paint or what have you. Yeah. So that would be good to clarify.

Sorry, Ken, did you want to say something?

DR. KLOC: Oh, I was just going to say that that will give us a chance to double check just exactly where it sits in relative vapor pressure and boiling point.

CHAIRPERSON ANASTASIO: Yeah, that would be great.

I just had two comments. The first one was nomenclature. In the response, you talk about a humanized mouse. I'm just curious what is that?

DR. KLOC: I believe a humanized mouse is -- well, it would be for -- I guess in that particular case that we were referring to, it would be mouse liver. So a humanized mouse liver would be a mouse liver in which the human -- human liver cells are introduced and the mouse is -- the mouse is --

DR. BUDROE: It's -- well, what it is, it's a transgenic mouse that has liver -- where the mouse liver cells have human CAR receptors.

DR. KLOC: Well, a -- yeah, that's a transgenic, and -- but there's -- there's also the so-called chimeric mouse model. And that's where human cells are introduced into the mouse liver and you have to do some special techniques to reduce the mouse's immune system in order to make that happen.

CHAIRPERSON ANASTASIO: I see. Okay. Thank you.

My other comment was related to the noncancer

impacts of PCBTF. So you have this compound that has noncancer toxicity and cancer toxicity. And how do you decide whether you're going to do a REL or you're going to do an inhalation unit risk factor? How does that calculus work?

DR. BUDROE: Well, the South Coast specifically asked us to evaluate the carcinogenicity of PCBTF. And that all essentially came off the NTP 2018 data. When that was released final, then, you know, everybody -- a lot of people were concerned about that. So that were -- that was the specific ask from South Coast was for a cancer unit risk for PCBTF.

CHAIRPERSON ANASTASIO: I see. Do you have any sense of where the REL would fall? I mean, is it -- is the noncancer toxicity high enough that maybe it deserves a REL or it's not an issue?

DR. BUDROE: I can't answer that question. We didn't go back and run the studies through our methodology.

CHAIRPERSON ANASTASIO: Um-hmm.

DR. BUDROE: But it's -- a lot of times, it's -- cancer is what drives risk in a hot spots risk assessment. That tends to be --

CHAIRPERSON ANASTASIO: Okay.

DR. BUDROE: -- a major driver.

CHAIRPERSON ANASTASIO: So that -- that tends to be the more sensitive endpoint.

DR. BUDROE: Potentially, yeah.

CHAIRPERSON ANASTASIO: Yeah. Okay. All right. Any other questions from the Panel?

PANEL MEMBER BLANC: Just -- it sort of got -- we went down a different tangent, but will you please check if there's any analogous chemicals in this group that you should look at. There may not be, but I came across something.

DR. BUDROE: Right. There may be analogs of this chemical, but --

PANEL MEMBER BLANC: That are in commercial use that you might want to refer to. I mean, just --

DR. BUDROE: Okay. Well, the reason I'm being hesitant is because it's hard enough to get information on PCBTF that is -- you know, has a fairly robust use, both in the U.S. and in California. Some of the derivatives like you're talking about, it is practically -- you cannot get information on. It's just not out there.

PANEL MEMBER BLANC: Okay. So that means you have looked. So that means that there isn't.

DR. BUDROE: Yeah. Well, I mean, you can do -- I mean, you wind up doing a Google search and you'll get Aldrich or, you know, a bunch of chemical companies,

they'll probably, yeah, we can make this for you. But then trying to find out is anybody actually selling it? You have no way to know.

PANEL MEMBER BLANC: Okay.

CHAIRPERSON ANASTASIO: So you don't have any sense that this is part of a class of solvents or carriers that are being -- that are used, because they're exempt from the VOC regulation?

DR. BUDROE: It's -- I haven't heard of any analogs being raised as an issue like they're also being used. That doesn't mean that if, for example, PCBTF loses its VOC exemption that somebody won't come up with a replacement for it. That could happen. But we just have no way to know -- know that at this point in time.

CHAIRPERSON ANASTASIO: Okay. Thank you.

Any other comments from the Panel?

All right. So with this discussion, and our very minor recommended changes, the Panel has fulfilled its statutory responsibility to review the health values being added to the risk assessment guidelines, so that the guidelines reflect the latest scientific understanding and data.

It seems that the panel is quite happy with the document, so thank you, OEHHA, for that. And based on Stan's comments, it seems that the most recent ACA public

comments don't add much compared to what their previous comments were, which were very well addressed by OEHHA.

So can I get a motion that we will take the revised document from OEHHA. I will look it over, and assume it looks fine, based on these very minor changes, it will be approved. Does the Panel --

PANEL MEMBER LANDOLPH: I so move.

CHAIRPERSON ANASTASIO: Joe, so moved?

PANEL MEMBER LANDOLPH: Yes.

CHAIRPERSON ANASTASIO: Can we get a second?

PANEL MEMBER KLEINMAN: Second.

CHAIRPERSON ANASTASIO: Okay. All in favor?

(Hands raised.)

(Ayes.)

CHAIRPERSON ANASTASIO: So it's unanimous in --

PANEL MEMBER GLANTZ: Stan votes yes, so you have it on the record.

PANEL MEMBER HAMMOND: Kathy votes yes.

CHAIRPERSON ANASTASIO: Okay. So it's unanimous in Sacramento and it's unanimous at SRP east and west.

So thank you very much, OEHHA.

DR. BUDROE: Thank you.

CHAIRPERSON ANASTASIO: So I'm looking over at Lori now for our lunch update.

PANEL LIAISON MIYASATO: Lunch is on its way. It

should be here in a few minutes.

CHAIRPERSON ANASTASIO: Lunch is on its way. And then can we try to move up then the AB 2588 discussion?

PANEL LIAISON MIYASATO: I'll check with them.

CHAIRPERSON ANASTASIO: Okay. Okay. So we're going to try to -- since we're a little early, we're going to try to move things a little earlier, so we'll be done sooner.

All right. Thank you, everyone. And please turn off your mics during the break.

(Off record: 11:45 a.m.)

(Thereupon a lunch break was taken.)

A F T E R N O O N S E S S I O N

(On record: 12:31 p.m.)

CHAIRPERSON ANASTASIO: It's 12:30. We're missing Ahmad, but I'm sure he'll be here shortly. So let's get started.

So I'm going to -- well, I'll give a little introduction first. So this is major agenda item number 2.

PANEL MEMBER GLANTZ: This is Stan. I'm here.

CHAIRPERSON ANASTASIO: Okay. Thank you, Stan.

Kathy, are you here as well?

We'll take that as a no, but we still have a quorum. So I'm going to push forward. Oh, and here is Ahmad. Perfect.

So this is major agenda item number 2, review of proposed changes to the chemical substances list in appendix A of the AB 2588 Air Toxics Hot Spots Emissions Inventory Criteria and Guidelines Regulations.

As we've discussed, under AB 2588, certain facilities are required to report their emissions of specified toxic chemicals. The implementing regulation has not been updated since 2007. So CARB has been doing this Herculean effort to update the list. We've talked with them about this several times.

Today, Dave Edwards, Assistant Division Chief of

the Air Resources Board's Air Quality Planning and Science Division is going to give us an overview of where we stand, a response to the SRP's comments from the November conference call that we had, and perhaps some brief responses to public comments that we received from November. And then CARB staff, Beth and Melissa, will discuss the draft letter of interim findings from the Panel on the adequacy of the proposed chemical list and functional group characterization of certain chemical classes.

So Dave, I turn it over to you.

AQPSD ASSISTANT DIVISION CHIEF EDWARDS: Thank you, Cort. And thank you once again to the Panel for listening to our item. And we've definitely really appreciated your input to this process. And I do think our chemical list has been stronger due to the comments that you've made over the past few months on this topic.

So just to kind of frame a little bit of where we've been with this and where we're going to be going, this is our fourth meeting on the AB 2588 chemical list proposed updates. We started last June giving you a brief overview and then provided the draft chemical list back in August of last year, and had two follow-up discussions in early October and late November of last year.

At each of those times, there was many different

discussions and comments for different lists of chemicals we should look at. And we've really appreciated the input that we received on the are we missing any important air toxic chemicals and are the functional groups appropriate for this regulation.

So, for today, there's going to be a few more follow-up items. I'm going to have staff go over some of the comment letters that we've received late last year and then as recently as a couple days ago; go over some of the outstanding discussion items that we had; and then go over the interim findings.

So with that, I did just want to sort of talk a little bit about our public process moving forward. So while we have been talking about this list now for the past few months, almost a year, this really is the beginning of our public process. And how we will move forward is that we will start our own rulemaking process in hopefully April of this year to have workshops across the state, because this is a very air district-centric rule as far as implementation goes. We'll be looking to have workshops in the five major air districts across the State, so that's Sacramento, Oakland, Los Angeles, San Diego, and Fresno. So that will be hopefully in the April time frame.

During that time, we'll take -- go over all of

our edits, provide documentation for the public to review, provide informal comments on, and then put out our formal rulemaking documents for an additional 45-day comment period. And we do hope to go to the Board in -- later this year.

And then following that, we do hope to come back to the Panel to give a report on where the chemical list ended up, what the final state of it looks like, and then hopefully have some findings or memorandum of what that looks -- that there is an acknowledgement that we came back and sort of have addressed all the comments that we've had.

So with that, I will turn it over to Beth to give an overview of the comments, discussion points, and interim findings.

--o0o--

(Thereupon an overhead presentation was Presented as follows.)

AQPSD STAFF AIR POLLUTION SPECIALIST SCHWEHR:

Thank you, Dave. Thank you, Cort and panel. The topics for discussion today are summarized on this slide. First, CARB staff would like to provide some of our perspectives on the comment letters that were submitted to the Panel from the American Chemistry Council, or ACC, and from the Council's Siloxanes Group, and most recently from

the Southern California Alliance of Publicly Owned Treatment Works.

Then we could provide some follow-up on a few items discussed prior -- at prior meetings, and then we can open up discussion on how the Panel would like to proceed with the draft interim findings as was mentioned.

If that sounds appropriate, I'll continue starting with the comment letters.

The first comment letter was submitted to the panel November 21st, 2019 from Steve -- Steve Risotto, Senior Director of the American Chemical Council.

Is that okay?

CHAIRPERSON ANASTASIO: (Nods head.)

AQPSD STAFF AIR POLLUTION SPECIALIST SCHWEHR: Okay. We'll summarize the main points in the letter and then provide some CARB staff perspectives.

So first, the main points in the ACC letter are that ACC expressed concern about moving from a traditional chemical-by-chemical approach to one that considers multiple chemicals within a group or class, and that such a broader group approach must be founded on similar toxicity within the group.

ACC requested an outline of the staff decision process regarding similarity of impacts and indicated objection to listing of groups of substance. The letter

stated that regulatory and policy measures should be substance specific.

The letter provided additional discussion about four specific groups: brominated and chlorinated flame retardants, isocyanates, perfluoro and polyfluoro compounds and the Per- and polyfluorinated chemical functional groups, and phthalates.

The letter cited the AB 2588 statute and commented that they are not aware of existing data that demonstrate that some of the PFAS chemicals have been detected in area.

Here are some CARB staff perspectives. We appreciate the detailed information and citations provided, and we have discussed the letter with our colleagues at OEHHA.

Some clarifications might be helpful about the groups. First, it is, in fact, our intention that substances be individually reported to the greatest extent possible. In the case of phthalates, for example, the group header is meant to be a convenient way to list the set of individual phthalate-related compounds together, so that they show up clustered on the list to provide better overall context, as opposed to having them structured -- scattered alphabetically throughout the list. We are not intending reporting of a lumped group of undifferentiated

phthalates.

Second, in some cases, there are examples of an actual group that is reportable. This is most often due to the group being cited in its entirety by one of the international, national, or other source lists that the hot spots statute requires us to use to compile the substance list.

However, even in those cases, to the greatest extent possible, we have also tried to list any key individual chemicals under the group, so that they will be reported explicitly, to the extent it is possible, for the reporting facility to make that distinction. The text of the full Emission Inventory Criteria and Guidelines, the EICG, provides more details on how mixtures are to be treated for emissions reporting. It stipulates reporting of individual chemicals, to the greatest extent possible.

Third, even for the three new classes of chemical functional groups that we are proposing, the intent is that the functional group defines whether a chemical would be applicable, but we would still be requesting the particular name and identification number for the chemical when a facility reports their chemical.

This would be clarified further in the text of the EICG during the formal public process for the amendments. And the three classes of functional groups

that we are proposing at this time have been carefully chosen to be cases where all chemicals having that functional group can be reasonably expected to have important toxicity that warrants inclusion on the AB 2588 list.

The overall EICG text will also address some other concerns that were raised in the letter that are separate from the chemical list itself. For example, the EICG specifies a relatively few types of industries, devices, and substances for which actual source testing and measurement is required versus the more typical cases where estimation methods are acceptable for most substances.

And then last, the provisions in the Hot Spots Statute that require CARB to compile the chemical list do not require a determination by CARB that the substance has been detected in air. In fact, the statute has language in one section that sets a high bar that limits CARB from even removing some substances, unless there is quote, "...no possibility that it will become airborne".

That was first he comment letter.

Turning to the second comment letter, shall I go ahead?

CHAIRPERSON ANASTASIO: (Nods head.)

AQPSD STAFF AIR POLLUTION SPECIALIST SCHWEHR:

Okay. The second comment letter was submitted to the Panel on November 21st, 2019 from the American Chemistry Council's Silicones Environmental Health and Safety Center, SEHSC. The main points in the ACC Silicon Center letter are that:

The Center requests that the underlying toxicological threat be explicitly identified for the chemicals being considered for inclusion using the statute's provision of CARB's own authority. In other words, these are the chemicals where we have listed the source list code as seven in our proposed appendix A.

The letter states that certain cyclosiloxanes, D4, D5, D6, and their group header, do not warrant inclusion in the AB 2588 program and do not present a chronic or acute threat to public health when present in the air.

The letter cites evaluations by Canada and Australia agencies. It quotes the Canada assessment as saying the substance was quote, "...not entering the environment in a quantity, or concentration, or under conditions that constitute, or may constitute, a danger in Canada to human life or health", unquote.

The letter states that the Australian assessment reached similar conclusions. The Silicone Center letter also states that the U.S. Environmental Protection Agency,

EPA, has excluded such cyclosiloxanes from the definition of volatile organic compound, VOC, for ozone-controlled purposes, based on negligible photochemical reactivity. The letter concludes that quote "The concentrations of D4, D5, and D6 found in ambient air do not pose a risk to human health, and as a result, including those substances, would not further the goals of the AB 2588 Hot Spots Program", unquote.

Here are some CARB staff Perspectives. As CARB staff, in consultation with OEHHA, has been reviewing the candidate chemicals, we have been documenting both the uses and the toxicity concerns for each of those source list seven chemicals, in order to address the rationale for each one being proposed for inclusion. This information will be part of our formal public rulemaking process for the Emission Inventory Criteria and Guidelines Regulation.

In our consultation with OEHHA staff, they have indicated there is sufficient toxicity data to warrant concern and the eventual development of various health effect values for the indicated cyclosiloxanes. Their photochemical reactivity in forming ozone is not an indication of their toxicity.

Moreover, the very fact that the U.S. EPA has designated these substances as exempt, in terms of VOC and

ozone control purposes, presents the very real likelihood that their usage may increase in the U.S., which is consistent with early information, and with what has occurred with other exempt VOC chemicals.

Also, the Canada assessment appears to be based on evaluating current levels of usage in that country. We would expect that those conclusions would not be applicable here, if usage and conditions in the U.S. trend upward. In fact, it is particularly important that exempt VOCs that have toxicity concerns should be included on the AB 2588 substance list, to help communicate these toxicity concerns before decisions about increased usage as a possible VOC substitute are made, which could have adverse effects on public health.

Turning to the third comment letter, this was submitted on February.

PANEL MEMBER BLANC: Can I just clarify. These letters have already gone out? You've already sent these responses?

AQPSD STAFF AIR POLLUTION SPECIALIST SCHWEHR: No.

PANEL MEMBER BLANC: Oh. Because you might want to parenthetically say that the chemical that we just considered was exactly the kind of chemical you're talking about.

AQPSD STAFF AIR POLLUTION SPECIALIST SCHWEHR: Yes, indeed.

PANEL MEMBER BLANC: What's that?

AQPSD STAFF AIR POLLUTION SPECIALIST SCHWEHR: Yes, that's the truth.

PANEL MEMBER BLANC: You know, it doesn't -- it's just as grown up. It's a carcinogen.

AQPSD STAFF AIR POLLUTION SPECIALIST SCHWEHR: Thank you. That's helpful.

The third comment letter that was just submitted on February 26th, 2020, was submitted to Dr. John Budroe of OEHHA regarding this 2588 item, and which we understand was forwarded to the Panel. The letter was from the Southern California Alliance of Publicly Owned Treatment Works, or SCAP.

This letter addresses future activities in the hot spots process that are separate from the chemical list itself. It is addressing a proposal that CARB has been starting to consider and discuss, and which we have been planning to recommend that we bring before this Panel in the near future.

Some clarifications may be helpful at this time to understand and address this comment letter. So first, the Hot Spots Statute defines a process for facilities to propose a plan for how they will estimate their emissions,

often using fairly generic emission factors and only where their emissions exceed the level of reporting accuracy that is specified for each chemical in the Emission Inventory Criteria and Guidelines.

Then, the air district reviews and approves the facility plan and a upon completion of reporting, the air district will use the facility's reported emission estimates, along with other parameters, to assign a prioritization status to their facilities. This helps districts set priorities for further evaluation of facilities, such as the need for health risk assessments.

Until now, the prioritization process only considered chemicals for which OEHHA and the SRP have formally approved cancer and non-cancer health effects values, leading many to be concerned which of the new or other chemicals emitted by a facility could possibly be either important or unimportant to public health.

So recently, CARB managers, in consultation with OEHHA managers, have been exploring the idea of grouping the new substances into default categories related to their estimated likely levels of health effects.

These default bins of their estimated health effects values are not intended to be used for formal health risk assessments or public notifications under the AB 2588 process. Rather, they're meant to provide useful

advance indications of situations where chemicals and sources could be important, and likewise where there are not likely to be impactful. This type of advance indication could be very valuable to facilities in understanding what aspects of their operations may have the greatest potential for concern and perhaps opportunities to mitigate those concerns well in advance of formal health risk assessments being acquired.

In addition, a very important benefit of these sorts of advance indications will be to assist OEHHA and the SRP in the process of prioritization of substances, most needing to be brought before the SRP for development of formal health effects values. At this point, we could pause for Panel questions and discussions of the comment letters, if desired.

CHAIRPERSON ANASTASIO: Any comments or questions on the panel?

Any comments or questions on the Panel?

I'll take that as a no.

AQPSD STAFF AIR POLLUTION SPECIALIST SCHWEHR:

Okay. All right, then. As the next topic of discussion, we'd like to follow up on a few items from the --

PANEL MEMBER GLANTZ: This is Stan. I have a comment. It would -- I really wish had -- you guys had

sent us this stuff in writing in advance for the same reasons that I was complaining about some of the industry comments in the early item, because -- you know, you're going through a lot of fairly technical stuff and I think it would be a lot easier to think about whether we agree with you or not, if we'd had a chance to actually read it and think about it before the meeting, rather than trying to pick it up all on the fly.

CHAIRPERSON ANASTASIO: Yeah. So just to follow up on Stan's comment, you know, our process with OEHHA typically is when they receive public comments, they'll respond to public comment and we'll get a written version of that. And that's very helpful for us to understand both sides of the argument. So if we have similar pieces moving forward, it would be great if you could provide us with written comments before the meeting.

AQPSD ASSISTANT DIVISION CHIEF EDWARDS: Yeah. Thanks for the clarification. We can do that in the future.

CHAIRPERSON ANASTASIO: Yeah, that would be great. Thank you.

Thank you, Stan.

Stan or Kathy, any other comments?

PANEL MEMBER HAMMOND: I agree totally with the need to see these ahead, especially something like this,

where it is complicated to think about doing groups -- functional groups. And I understand where ACC is coming from, at the same time as I support this attempt to do this broader thing. I think it's a good thing to do, but we need to think very carefully having time to read this over and think it through ahead of time would improve our ability to respond.

CHAIRPERSON ANASTASIO: Yeah.

AQPSD STAFF AIR POLLUTION SPECIALIST SCHWEHR: Okay. Thank you.

As the next topic of discussion, we would like to follow up --

PANEL MEMBER KLEINMAN: Excuse me. Sorry. This is Mike. I wanted to just ask you to touch a little bit more on the comment about compounds for which they don't have adequate measures for emission source testing. Will -- you know, is there going to be something in the documentation that allows for them to come up with some alternative method for, you know, documenting what their emissions might be?

AQPSD STAFF AIR POLLUTION SPECIALIST SCHWEHR:

Yes. The -- the overall Emission Inventory Criteria and Guidelines specifies sort of a hierarchy of methods that are applicable to estimating various substances. In some cases, it actually requires source

testing, where that is really probably the only way to get at something like complicated set of dioxins.

In other cases, it specifies that you might be able to use emission factors derived from prior testing. You might be able to find emission factors from EPA or other sources that are satisfactory. And sometimes that's -- a material mass balance might be an acceptable method. Each of the chemicals does carry with it a level of reporting accuracy that's expected. And so if the method is sufficient to get you to within that range of reporting accuracy, these estimation methods are fine.

PANEL MEMBER KLEINMAN: Thank you.

AQPSD STAFF AIR POLLUTION SPECIALIST SCHWEHR: Anything else?

CHAIRPERSON ANASTASIO: Yeah. Please continue, Beth.

AQPSD STAFF AIR POLLUTION SPECIALIST SCHWEHR: As the next topic of discussion, we'd like to follow up on a few items from the previous meetings.

I think as Dave said, we have very much appreciated the many fruitful suggestions by the Panel, which we have explored regarding candidate chemicals for inclusion.

These suggestions have helped us strengthen the list considerably. We've utilized many, many hours of

time of our OEHHA colleagues in researching and interpreting toxicity data for many hundreds of these suggested individual chemicals, as well as understanding the nature of the uses of the chemicals. And we do thank them greatly.

We pursued the suggestions of the Panel members to explore other lists. And in many cases, this resulted in quite a few additional chemicals being proposed for inclusion from various other lists. In other cases, the review of toxicity data and usage information appeared not to warrant some of the chemicals on those other lists to be added at this time.

As we've reported in prior meetings, we have pursued some of the suggestions for possible additional functional group classes. It became clear in our consultations with OEHHA that for some, quite a bit of further delving into literature and evolving structure activity and mechanistic understanding would be needed to define appropriate classes and subclasses that would be fully defensible in a regulatory process.

In those cases, we identified as many appropriate specific chemicals as we could within the class, and we will be keeping our attention on the state of the science as we plan to amend the chemical list more frequently in the future.

We would like to highlight that the suggestions to consider the list from National Institute for Occupational Safety and Health, NIOSH, and the American Conference of Governmental Industrial Hygienists, ACGIH, including their under-study list, were quite intensive but also fruitful.

These lists cover about 700 chemicals in the net. And after accounting for existing appendix A1 substances and ones already being proposed for new inclusion, it still meant needing detailed review of close to 300 candidates. We are still wrapping up the last of the review. We estimate there will be on the order of no more than about a hundred proposed for inclusion.

One of the benefits of working more with these lists, particularly the ACGIH publications, is that it has helped us fill in more of the other types of health effects that have also been suggested. ACGIH in particular does flag effects, such as lower respiratory tract and some cardiopulmonary effects, as well as things like liver damage, kidney damage, thyroid effects, and they have notation for respiratory sensitizers and asthma as well.

The Panel's suggestion to take note of their inhalable particle and vapor flag was very helpful in evaluating heavier molecular weight and solid chemicals

that may still have the potential to cause airborne concern.

We have also continued to directly pursue information on many of these types of health effects. We have confirmed that the list already was covering a multitude of important chemicals having these other health effects, but this has helped us to flag them better. We've also been utilizing data sources such as the bioconcentration factors in the U.S. EPA's CompTox Dashboard to help identify persistent bioaccumulative toxics, in addition to the PBTs identified under the federal TRI list and the EU REACH list.

At this point, we could pause for Panel questions and discussion of the follow-up items, if desired?

CHAIRPERSON ANASTASIO: Any comments related to the follow-up items from our last meeting?

PANEL MEMBER KLEINMAN: Just one. Within -- the last time we talked, I did raise the issue of the AB 617 communities, and that they had selected were identified specific compounds. And I just wanted to know that those compounds were somehow incorporated through all the other research you've done.

AQPSD STAFF AIR POLLUTION SPECIALIST SCHWEHR:

Yes. Yes. And, in fact, the -- when we talked with some of the liaisons for those communities, we did

identify a couple of extra ones and we added them to the list for proposed inclusion.

PANEL MEMBER KLEINMAN: Thank you.

PANEL MEMBER RITZ: Just one clarification question. You did not mention a reproductive or neurotoxicity. Are those health outcomes you're considering.

AQPSD STAFF AIR POLLUTION SPECIALIST SCHWEHR:

Yeah. So the easy ones for us were -- were where there is an authoritative body. So, for cancer, there are many authoritative bodies already suggested for this list. For the developmental and reproductive toxicants, we are primarily relying on the Prop 65 listings. But in reviewing individual chemicals, if OEHHA has brought forward a chemical that the panel has reviewed, and that that was one of the endpoints we will also give it a DART indication for example.

And then we have also been tracking the neurotoxins to the greatest extent where we can find that data.

CHAIRPERSON ANASTASIO: Stan or Kathy, anything on the line?

All right. Please proceed, Beth.

PANEL MEMBER HAMMOND: I just would say -- it's excellent. And I'm very pleased that you were able to

find some good information there. Good.

AQPSD STAFF AIR POLLUTION SPECIALIST SCHWEHR:

Thank you. Anything else?

Okay. At this point, the last topic of discussion for this agenda item is regarding the draft interim findings. And I believe -- Lori, has that been handed out.

PANEL LIAISON MIYASATO: (Nods head.)

AQPSD STAFF AIR POLLUTION SPECIALIST SCHWEHR:

Okay. So that has been handed out and copies are also available in the back for the public. Some possible draft language that might be helpful to the Panel for developing an interim findings document, as was suggested at the last meeting.

So CARB staff has provided some of the background language and some basic ideas that the Panel might choose to build upon. Should we open this item up for discussion, Cort? How would you like to proceed? Is there a need for an overview?

CHAIRPERSON ANASTASIO: So this is something we talked about at our November teleconference. And so this list is from the panel to CARB about our findings -- or our interim findings related to the revisions to the 2588 list.

This has been sent out by email to the Panel a

week or two ago. But here is my suggestion, I suggest let's take ten minutes, everybody on the Panel reads the letter, and then we'll have a discussion and any potential edits that we would like to make to it. Because the idea is at the end we're going to vote on this, as the letter coming from the Panel, going to CARB, talking about our interim findings related to the revisions to 2588.

So let's spend until 1:10 reading this, and then we'll re-adjourn[SIC] and Panel members can then give their comments. If anyone doesn't have the letter on the Panel, I think Lori has additional copies.

All right. Thank you.

(Off record: 1:02 p.m.)

(Thereupon a recess was taken.)

(On record: 1:10 p.m.)

CHAIRPERSON ANASTASIO: Is everyone finished?

Okay. So, Beth, maybe so that we have it in the record, and it's fresh in everyone's mind, could you perhaps read on page two. I mean, the -- essentially, read the interim findings itself. So "The materials, as noted above, convincingly demonstrate that:", maybe read there to the end and then we can have a discussion.

AQPSD STAFF AIR POLLUTION SPECIALIST SCHWEHR:

Right. I'll start with the sentence just before that.

"Based on its review of the materials provided, the Panel prepared the following interim findings, which are submitted to the CARB Executive Officer.

"The materials, as noted above, convincingly demonstrate that:

"1) CARB staff has proposed appropriate new substances compiled in accordance with the six lists outlined in Section 44321, subdivisions (a) to (e) of the AB 2588 statute.

"2) The substances proposed for addition based the authority granted to CARB by Section 44321(f) of the statute have been recognized to present a chronic or acute threat to public health when present in ambient air.

"3) Substances in the three broad 'functional group', categories proposed by CARB(poly- and per-fluorinated chemicals; derivatives and substituted versions of polycyclic aromatic compounds containing any halogen atom; and isocyanates) can be reasonably expected to present a chronic or acute threat to public health when present in ambient air. The Panel supports the functional group concept, along with its continued development and

evaluation".

Should I continue?

CHAIRPERSON ANASTASIO: Go to the end, please.

AQPSD STAFF AIR POLLUTION SPECIALIST SCHWEHR: Okay.

"The Scientific Review Panel commends CARB and OEHHA for a comprehensive review of the chemical lists, available health data, and other scientific information. We are supportive of the proposed revisions to Appendix A of the EICG regulation.

"The Panel has reviewed the scientific data on which the proposed revisions to the Appendix A list of chemicals is based, and concludes that the revisions are supported by sound scientific knowledge about the health threats posed by these chemicals.

"Upon conclusion of CARB's rulemaking process, the Panel wishes to have a presentation on the overall outcome and incorporation of the chemical list and any other items of interest into the final regulation".

CHAIRPERSON ANASTASIO: Thank you, Beth.

So I now bring it to the Panel. Comments about our letter of interim findings?

PANEL MEMBER BLANC: I have a purely technical a question. Since you're still in the midst of making your list, Dave, per your -- per your comments, so here our findings are that we endorse the list, but the list is still somewhat in flux. So I'm a little confused or seeking clarification if we can come up with wording that allows for that, because the wording, as such, it's like a done deal. But we're saying that we are approving something that we actually haven't seen the final version of, which would be fine if we said, you know -- you know, we've seen it an advanced version of this and are confident that the -- that the changes that are in process will also be consistent, or some wording like that.

Cort, do you see where I'm coming from?

CHAIRPERSON ANASTASIO: I think so. Can you show me specifically where in the text, like which sentence, and then we can --

PANEL MEMBER BLANC: Well, it's more than one place --

CHAIRPERSON ANASTASIO: Oh, okay.

PANEL MEMBER BLANC: -- but it's CARB provided the a list of over 800. We gave our input to the substances. We -- it's all done in the past tense.

CHAIRPERSON ANASTASIO: I see.

PANEL MEMBER BLANC: I think there just needs to

be a phrase or a sentence --

CHAIRPERSON ANASTASIO: Right.

PANEL MEMBER BLANC: -- saying, you know, we realize that the list is not completely finalized, but, you know -- anticipating it will continue on in this way, we approve it or something -- it's a -- it's approval -- it's almost a contingent approval. It says we approve what we've seen and what we anticipate --

CHAIRPERSON ANASTASIO: Right, I understand --

PANEL MEMBER BLANC: -- what will evolve.

CHAIRPERSON ANASTASIO: -- right, what you're saying. I mean, so, Dave, will CARB be -- I mean, I know you'll be coming back to the Panel. Would you -- are you expecting or would it be helpful to have a -- instead of an interim letter of findings, at some point, a final letter of findings, or is this going to be the letter from the Panel?

AQPSD ASSISTANT DIVISION CHIEF EDWARDS: Sorry. So this is Dave Edwards. We do anticipate coming back at the end of our process to sort of get a -- to get a final findings.

CHAIRPERSON ANASTASIO: Okay.

AQPSD ASSISTANT DIVISION CHIEF EDWARDS: That would sort of conclude -- so this would be after we go through our Board process.

PANEL MEMBER BLANC: So again, I would just put in a sentence saying we realize that this list is, to an extent, still interim, but are confident that evolving changes will be consistent with -- you know, with --

CHAIRPERSON ANASTASIO: Right. We could add a phrase, something along the lines of, based on the list as it exists at this point.

PANEL MEMBER BLANC: Bearing in mind that it will have additional -- I don't know, items.

CHAIRPERSON ANASTASIO: There will be additional changes to the list.

AQPSD ASSISTANT DIVISION CHIEF EDWARDS: If I may make a suggestion. The first full paragraph after number three on page two, the last sentence. So, "We are supportive of the proposed revisions to Appendix A of the EICG regulation"...."understanding that the Panel anticipates changes..." --

PANEL MEMBER BLANC: Further changes.

AQPSD ASSISTANT DIVISION CHIEF EDWARDS: "...further changes to be consistent with the direction given.

PANEL MEMBER BLANC: Yes.

CHAIRPERSON ANASTASIO: That's great.

PANEL MEMBER BLANC: And then in the theme of there IS nothing which IS too trivial, in general, I would

put "acute" first and "chronic" second in the two places where it appears, just logically, unless that's statutory language.

AQPSD ASSISTANT DIVISION CHIEF EDWARDS: It is statutory language.

AQPSD STAFF AIR POLLUTION SPECIALIST SCHWEHR: That is -- that is a quote from the statute, but --

PANEL MEMBER BLANC: Then do it that way. That's fine. And what about -- and that's why it doesn't say present a potentially chronic or acute, because you can't say potentially either?

AQPSD STAFF AIR POLLUTION SPECIALIST SCHWEHR: Yes, it's a direct quote from the statute.

PANEL MEMBER BLANC: All right. That's fine. Never mind.

CHAIRPERSON ANASTASIO: Other comments from the Panel?

PANEL MEMBER KLEINMAN: I think I brought this up the last time as well, but it would help -- yeah, I think it would be helpful to have a clear delineation of what are the criteria that are going to be used to select which of these compounds from the huge list of potential compounds are going to be selected for review. I know it's always -- there are many, many factors involved. But

I think it would be helpful just to have, you know, some clarification of what it takes to put a compound on the high priority list of potential compounds to review.

CHAIRPERSON ANASTASIO: So I'll just speak up a minute. My understanding is that's an OEHHA decision, is that -- I'm looking over at John Budroe for a visual.

DR. BUDROE: (Nods head.)

CHAIRPERSON ANASTASIO: He's giving me that's a big yes.

(Laughter.)

CHAIRPERSON ANASTASIO: So to the extent that CARB would like to talk about their process, I suppose that's okay. You know, I imagine you have specific criteria, John, that decide who rises to the top?

AQPSD ASSISTANT DIVISION CHIEF EDWARDS: I guess just maybe to sort of speak to that a little bit for the -- within the context of here. Would it be useful to maybe put a little bit about what the process is moving forward? So I guess sort of what I'm thinking here is, as this regulation takes effect and these chemicals are starting to be reported over time, CARB will share this information with OEHHA and work on prioritizing the new -- the new chemicals. Is that too simplistic or --

PANEL MEMBER KLEINMAN: I know the process has --

AQPSD ASSISTANT DIVISION CHIEF EDWARDS: Okay.

PANEL MEMBER KLEINMAN: -- you know, got to be kept flexible.

AQPSD ASSISTANT DIVISION CHIEF EDWARDS: Um-hmm.

PANEL MEMBER KLEINMAN: There are always things that are going to bring something to the top of the list. But I guess I'm sensitive to the communities that are taking part in this AB 617, you know, process. And they have compounds that they think should at least be given consideration. And so is there a way for that sort of information to get to CARB and to OEHHA to help, you know, at least raise the issue, so that their minds can be put at rest. You could be -- you know, they could be told that maybe this is already taken into account. It's on a list or whatever.

But I think there is some underlying, let's say, uncomfortableness about the fact that the process isn't as transparent as it might be, because there are lots of other -- there are too many factors, you know, to put it on this totally. But just some wording to the effect of how, you know, one can bring a topic of concern up and have it, you know, evaluated.

AQPSD ASSISTANT DIVISION CHIEF EDWARDS: So sort of -- I'm going to be looking to Beth right now. I'm going to make some -- a suggestion. Beth is familiar that I make these sometimes in there that's not exactly the

most logical.

But one thought that I'm having is not necessarily with the chemical list, but potentially add an action item that we will look into, when we are doing our regulatory updates on the textual part of this to put some mechanism for notification or an -- a sort of -- I'm thinking like as simple as like an email contact for anyone to contact us to talk about a chemical that they feel is important and that we will have a follow-up evaluation type of process associated with that.

PANEL MEMBER KLEINMAN: I think something like that would be very helpful.

AQPSD ASSISTANT DIVISION CHIEF EDWARDS: Okay. Beth.

All right.

CHAIRPERSON ANASTASIO: Other comments from the Panel?

Yes, Beate.

PANEL MEMBER RITZ: This might just be my misunderstanding, but I'm having trouble with that second to the last paragraph. To me, it reads as if we've already seen the results of --

PANEL MEMBER BLANC: That was --

PANEL MEMBER RITZ: That was your comment too.

PANEL MEMBER BLANC: -- a good point, and I think

that they're --

PANEL MEMBER RITZ: They're going to rewrite it.

PANEL MEMBER BLANC: -- be inserted -- an inserted line would address that.

PANEL MEMBER RITZ: Okay.

PANEL MEMBER BLANC: That we have seen interim versions, but not the final version.

PANEL MEMBER RITZ: Okay. So that's that one as well.

PANEL MEMBER BLANC: That's why -- that was the rationale.

PANEL MEMBER RITZ: Okay. Good.

CHAIRPERSON ANASTASIO: Yeah.

AQPSD ASSISTANT DIVISION CHIEF EDWARDS: Going back to Dr. Kleinman's comment. What I would propose to do at the end of page two, so after the paragraph, "Upon conclusion", just sort of put as an action item, one, "CARB staff will evaluate, including a mechanism for public feedback in the prioritization of risk factors into the EICG".

How about a -- just leave it at "A mechanism for public feedback". So, "CARB staff will evaluate, including a mechanism for public feedback in developing..."

Okay. Here we go again. "CARB staff will

evaluate, including a mechanism for public feedback, in weighing the importance of chemicals".

Does that sound --

PANEL MEMBER KLEINMAN: Thanks. That would be great. Thank you.

AQPSD ASSISTANT DIVISION CHIEF EDWARDS: Thank you.

CHAIRPERSON ANASTASIO: Are other comments?

PANEL MEMBER BESARATINIA: What happens after your evaluation for the mechanism of feedback? What would be the next step?

AQPSD ASSISTANT DIVISION CHIEF EDWARDS: I think that would be then talking to OEHHA about that. I guess just as a corollary to this, we are going through a similar process with our criteria -- reporting regulation for the reporting of criteria and air toxics. And we've received a couple of comments regarding ground-truthing of sources. So we're considering including a mechanism for the AB 617 communities, but also general public, or anyone that's interested to sort of set up a procedure for how we would follow up on a request to evaluate a source that potentially doesn't have an air permit.

So I would envision something -- whatever sort of comes out of that process, which is a little bit ahead of this one, will likely have similar language to notify CARB

by this email address or something like that, and then we would have X number of days to follow up with some sort of written feedback.

PANEL MEMBER BESARATINIA: Thanks.

CHAIRPERSON ANASTASIO: Okay. Thank you, Dave.

Any other comments from the Panel?

All right. So since the edits proposed were relatively minor, I would say, I'd like to call a vote. So I will work with CARB to revise it, based on the Panel's feedback. And I would like to have a vote, so that we either accept the draft -- or, sorry, accept the interim letter of findings or not.

So could I got a motion on accepting the letter?

PANEL MEMBER KLEINMAN: I move that we accept the letter on interim findings.

CHAIRPERSON ANASTASIO: Thank you. Could I get a second.

PANEL MEMBER LANDOLPH: Second.

CHAIRPERSON ANASTASIO: Joe. Thank you.

So let's take the vote. All in favor of the letter?

(Hands raised.)

(Ayes.)

CHAIRPERSON ANASTASIO: So it's in unanimous in Sacramento.

Kathy and Stan?

PANEL MEMBER HAMMOND: Aye.

CHAIRPERSON ANASTASIO: Stan?

PANEL MEMBER GLANTZ: Aye.

CHAIRPERSON ANASTASIO: Okay. Great. Thank you very much. So the Panel unanimously approves the letter of interim findings.

We'd like to thank you CARB again for all your work on this very important update of the a appendix A of AB 2588. And we look forward to your future presentations about how things are moving forward.

AQPSD ASSISTANT DIVISION CHIEF EDWARDS: Yeah. And also, yeah, thank you, Cort and to the rest of the panel for all the support you have provided on this appendix A update. And we'll now be proceeding forward with our public rulemaking process. And we'll look forward to coming back and giving you an update once we're completed with that later.

CHAIRPERSON ANASTASIO: Great. Thank you Dave, Beth, and Melissa.

The last agenda item is consideration of administrative matters. I actually have a question for OEHHA. So, John, could I -- could I bother you for a minute to come to the microphone. I forgot to ask you this before the meeting, and I apologize for that. But

can you just give us a quick update on where we stand with tolu -- where were we? We were doing cobalt. Who are the two that are unfinished at this point?

DR. BUDROE: I was afraid you were going to ask me about that. I dearly wanted to have toluene to the Panel Chair by the meeting, so that we could check that one off. But we're probably about three to four weeks away from getting it to you.

CHAIRPERSON ANASTASIO: Okay.

DR. BUDROE: And cobalt is -- we actually have a revised document that we're in the process of internal review with right now. So I would say, looking over there at Daryn -- Dr. Daryn Dodge in the audience, two months.

CHAIRPERSON ANASTASIO: Two months. Okay. That's great. Thank you for that update. Appreciate that.

Any other questions from the Panel?

PANEL MEMBER BLANC: These are -- what nature documents are these?

DR. BUDROE: These were the toluene REL document that the Panel had reviewed and was scheduled to go back to the Chair for concurrence in the post-SRP meeting revisions in the cobalt cancer document also.

PANEL MEMBER BLANC: So they both -- they're just for the Chair's review.

DR. BUDROE: Correct.

PANEL MEMBER BLANC: So then what are we anticipating of new documents?

DR. BUDROE: Right now, it looks like we're -- we won't have anything for the July meeting. For the fall meeting, I'm assuming -- kind of assuming there's going to be in roughly September or October, and we will have most likely a trivalent chromium REL document, and possibly a trimethylbenzene REL document.

CHAIRPERSON ANASTASIO: Yeah. So we're working with OEHHA to figure out the timing for that. And Kath -- or Lori will be asking for availability at some point soon, so that we can set up that meeting and consider those documents.

Anything else on that, Paul?

PANEL MEMBER BLANC: No.

CHAIRPERSON ANASTASIO: Okay.

PANEL MEMBER BLANC: No.

CHAIRPERSON ANASTASIO: So while we're on that, I'd like to remind the Panel that our next meeting is going to be a conference call. So it will be on the morning of July 9th. Now, there is a typo on your agenda, so make sure you have in calendar that it's July 9th and it's going to be 9:00 to 11:30. That will be our plan. And we're going to potentially continue hot spots

discussion, if Dave and company have additional items to discuss then. We will get an update on the AB 617 Consultation Group from Mike Kleinman who's been participating in that.

Any other items before we adjourn?

I can't remember. Do I need a motion to adjourn?

PANEL MEMBER BLANC: I move we adjourn.

CHAIRPERSON ANASTASIO: Can I get a second?

PANEL MEMBER KLEINMAN: Second.

CHAIRPERSON ANASTASIO: All in favor?

(Hands raised.)

(Ayes.)

CHAIRPERSON ANASTASIO: All right. Great. Thank you everyone for your hard work.

(Thereupon the California Air Resources Board, Scientific Review Panel adjourned at 1:31 p.m.)

C E R T I F I C A T E O F R E P O R T E R

I, JAMES F. PETERS, a Certified Shorthand Reporter of the State of California, do hereby certify:

That I am a disinterested person herein; that the foregoing California Air Resources Board, Scientific Review Panel meeting was reported in shorthand by me, James F. Peters, a Certified Shorthand Reporter of the State of California;

That the said proceedings was taken before me, in shorthand writing, and was thereafter transcribed, under my direction, by computer-assisted transcription.

I further certify that I am not of counsel or attorney for any of the parties to said meeting nor in any way interested in the outcome of said meeting.

IN WITNESS WHEREOF, I have hereunto set my hand this 4th day of March, 2020.

JAMES F. PETERS, CSR
Certified Shorthand Reporter
License No. 10063