

DRAFT – do not quote or cite

**Tenth Meeting of the Health Effects Advisory Committee (HEAC)  
for Permissible Exposure Limits for Airborne Contaminants in the Workplace  
California Code of Regulations, Title 8, Section 5155  
March 5, 2019  
Elihu Harris State Building, 1515 Clay Street Oakland, California**

**Division of Occupational Safety & Health**

Panel: Garrett Keating, Chris Kirkham

Notes: Keummi Park

**HEAC Members Present**

Eric N. Brown, Dr. PH, CIH, CSP, SCS Engineers (Industrial Hygiene)

Michael Bates, PhD, UC Berkley School of Public Health (Epidemiology)

William Forest, MPH, Santa Cruz County Department of Public Health (Epidemiology/Toxicology)

Bob Harrison, MD, MPH, School of Medicine, University of California, San Francisco (Occupational Medicine)

Sarah Janssen, MD, PhD, MPH, Occupational Medicine Department, Kaiser Permanente (Occupational Medicine)

Patrick Owens, MSPH, CIH, Shell Oil Martinez Refinery (Industrial Hygiene)

Kent E. Pinkerton, PhD, UC Davis (Pathology/Inhalation Toxicology)

James Unmack, CIH, Unmack Corp. (Industrial Hygiene)

**Public and Interested Parties**

Dan Leacox, Leacox and Associates

Bob Nocco, Chevron

Kashyap Thakore, California Department of Public Health, HESIS

Jennifer McNary, California Department of Public Health, HESIS

Tom Hmiel, American Chemistry Council

Lindsay Stovall, American Chemistry Council

Mike Geyer, KERNTEC Engineering

Michael Horowitz

Peter Scholz, DOSH

Jim Kegebein

Aryan Kumali, Southern California Edison

Josh Potocko

Norman Wright

Anthony Boone, San Francisco Department of Public Health

Maggie Robbins, Worksafe

Harvard Fong, California Department of Pesticide Regulations

Ryan Guinness

Natalie Rainer, Keller and Heckman

Shanon Winston, Contra Costa County

David Ross, California Department of Transportation

Elisa Koski, Occupational Safety and Health Standards Board

DRAFT – do not quote or cite

**Below are detailed notes of the advisory meeting. These notes do not represent a transcript of the meeting, and are simply a summary of the notes taken by the people conducting the meeting.**

**Garrett Keating** and **Chris Kirkham** opened the meeting. **Kirkham** introduced the committee members and staff, covered housekeeping items and explained the agenda and handouts.

**Keating**, further explained agenda items and plan for the meeting. Asked for input from stakeholders on usage etc. Described some of the handouts in more detail.

### **N-, Tert-Butanol – Final Review**

**Keating** summarized the corrections made to the draft Cal/OSHA PEL recommendation summary from the last meeting for butyl alcohols and explained that they are on this agenda for final review. Opened the floor to the committee. Mike Cooper asked Keating to explain the rationale for why the limit was lowered for n-butanol by approximately a factor of three. Keating said it was based on reinterpretation of the human irritation data and that he would clarify this in the presentation to the Standards Board.

**Dan Leacox**, asked if when Keating said lowered by a factor of 3, he meant that a safety factor was employed, or lowered from another OEL?

**Keating** explained its a factor of approximately 3 reduction from the current PEL based on the human subject data. Irritation effects were observed at 50 ppm but not 20 ppm. He will clarify this in the presentation to the board.

**David Ross, Cal Trans**, asked when California changes a PEL, what is done with the SDS that is typically based on federal regulations. He asked about what one does when people use the federal PELs in California.

**Kirkham** explained that SDSs must contain federal PELs but wasn't sure whether SDSs must contain the Cal/OSHA PELs. If employees fall under Cal/OSHA jurisdiction, then the Cal/OSHA PELs rather than the federal PELs apply to them.

**Keating** reminded that often a lower limit, such as in ACGIH TLV, is already on the SDS.

### **Benzophenone (BZP) – Discussion**

**Keating** noted that benzophenone is one of the remaining priority 1 substances from the current list, and that the documents presented are the first draft of a new format that was suggested by committee members to tabulate health effects information as a summary for the first presentation. The draft consists of tabulated cancer, reproductive, and endocrine data with brief summary conclusions. BZP has very few OELs at this time. There is a WEEL for this compound but no recommended PEL yet in this document. Keating sought guidance from this committee on where to focus the health effects review. There are multiple endpoints to consider, but the committee needs to select one for the basis for hazard assessment. Reproductive/developmental with BZP studies are basically negative. The carcinogenicity data is more relevant in that renal tumors are seen in multiple species with significant dose response data within those groups. Mutagenicity is mostly negative. BZP itself seems not to be mutagenic or an endocrine disrupter, but a metabolite is. 4-Hydroxy BZP is mutagenic and estrogenic, however there is not good toxicokinetic data on BZP in either animals or humans.

DRAFT – do not quote or cite

**Sarah Janssen** asked about whether there were any endocrine receptor (ER) beta studies found given that these studies are relatively old, and the binding assay was for ER-alpha but there is also ER-beta.

**Keating** replied that he was not sure, but he would look into it.

**Janssen** volunteered to look more into BZP. BZP is used broadly in many personal care products such as sunscreens, and that there was a biomonitoring study of firefighters showing elevated levels, so should not discount endocrine disruption potential.

**Keating** replied that this brings him to his point in that this substance should be further discussed in a subcommittee to evaluate the endpoints and bring it back to this committee. **Janssen** volunteered for the committee. **Keating** noted that there was one hazard assessment using rat kidney data and that would be the place to start, but wants to review all data with a subcommittee first. **Keating** also invited HESIS to sit on the subcommittee as has been done for other compounds.

**Kent Pinkerton** asked Janssen about the firefighter study she mentioned. **Janssen** replied that it was a 2016 firefighter study from Southern California and that she would pass it around to the committee.

**Keating** continued discussing the handouts. He mentioned that Cal/OSHA provided usage data from the CERS database showing most usage in personal care products, a major UV filter in paint, and as a UV filter in paper.

**Kirkham** asked about the usage data table in the handout on page 3. **Keating** clarified that all the data was from CERS and includes SIC code, number of users, and quantity in gallons on site.

**Keating** then described the document discussing epidemiology. There is a number of epidemiology studies primarily focusing on endocrine endpoints. He said he would review with the subcommittee all of the tables in the substance sheet to fine-tune them.

**Michael Bates** asked about the section on endometriosis that appears to describe effects from 2-4 BZP, but does not see the data. **Keating** replied that 2-4 BZP is a metabolite of a BZP derivative and is not the target compound for this project so he did not include the table. Much of the literature on the estrogenic effects for BZP refers to BZP derivatives such as BZP 2 and BZP 3 which generate a different metabolic profile than BZP and are clearly estrogenic. Keating asked for stakeholder input.

**Will Forest** commented that Hawaii is banning sunscreen primarily due to environmental concerns. Keating replied that many of the endocrine studies are environmental exposures. **Janssen** indicated that it is also added to prolong shelf life.

**Keating** concluded that BZP will be coming back to committee when we have more information.

### **Sulfur Dioxide (SO<sub>2</sub>) – Discussion**

**Keating** briefed the SO<sub>2</sub> summary. ACGIH recommendation is to do away with the 8-hour TLV and adopt a 15-minute STEL at 0.25 ppm based on effects in asthmatics. At the previous meeting, there were questions about the controlled human studies with asthmatics so Keating included some additional studies on that. Keating reviewed the slides and presented the tables discussing the various studies and the endpoints used to demonstrate clinical effects in the subjects. The two endpoints presented were forced expiratory volume in 1

DRAFT – do not quote or cite

second (FEV1) and specific airway resistance (SRaw). Keating invited feedback on the tables presented (see handouts).

**Patrick Owens** asked about what the duration of exposure was in the study. **Keating** replied that he thought it was 15 minutes, but that he would track down that study and check. **Owens** asked if these were un-medicated subjects. **Keating** replied that oral medication was withheld for 48 hours and inhaled medication for 12 hours prior to testing.

**Harrison** commented that the US EPA and California Air Resources Board (CARB) set 1-hour and 24-hour standards for SO<sub>2</sub> at 0.25 ppm for 1-hour and 0.04 ppm for 24-hours, and they have comprehensive literature reviews that document and support those numbers, so the committee should start there. He asked whether there is a reason why the committee doesn't go from the community to workplace for sensitive populations. He proposed a small sub-committee to look at the environmental studies and look at the applicability to workplace. **Keating** responded that one of the issues is the exposure to multiple ambient air pollutants in the community-based studies.

**Owens** asked if the studies were based on elderly or children. **Keating** replied that the ambient studies are based on asthma reports, ER reports, and not controlled studies. There are many factors that go into those EPA community studies so we can look into those and get direction.

**Pinkerton** stated he assumes that SO<sub>2</sub> exposures are primarily due to coal burning where there are high levels of sulfur in the environment. He asked about where the exposures come from in the workplace.

**Harvard Fong, Department of Pesticide Regulation**, answered that SO<sub>2</sub> is a “dual use” material in that it has a pesticidal activity (grape fumigation, wine barrel fumigation, fermentation termination in the wine industry, and in field packaging of grapes). **Keating** added that it is used in flat glass manufacturing and water treatment. **Owens** added that it is produced at refineries, and its an intermediate.

**Keating** continued reviewing the studies.

**Bates** asked if the study subjects were exposed to the methacholine and SO<sub>2</sub> at the same time. It looks like they were not at the same time.

**Forest** mentioned that 22.6% were methacholine positive in the German study and asked if that is representative of the asthmatics in the adult U.S. population. **Forest** stated that the assumption is they were not exposed to metacholine and SO<sub>2</sub> at the same time. He asked whether the subjects were workers and **Keating** stated he would check but he thought it was the general population. **Pinkerton** replied that in some populations you might get as high as 22%, but more typical would be 10 to 15%.

**Harrison** asked what the current PEL is. **Keating** replied that the current 8-hour PEL is 2 ppm, and we are looking at setting a new STEL. **Kirkham** indicated that if we were to adopt a STEL that is lower than the PEL, it would make the PEL irrelevant. Consensus from **Harrison, Unmack, Owens**, etc. is that it would not make sense to set the STEL at a level so much lower than the PEL. **Keating** brought it back to looking for direction on what end point to work with. Reviewed Labor Code section 144.6 which requires the standard, to extent feasible, assures that no employee suffer material impairment.

**Owens** brought up that “material impairment” is sort of a grey area. **Forest** replied that for asthmatics it is a material impairment because they can't breathe. **Janssen** agreed. **Unmack** asked what the recovery period is,

DRAFT – do not quote or cite

and whether it means that you cannot return for your next shift, or that you cannot complete your shift.

**Owens** mentioned that the odor threshold is just below 0.2 ppm, and it's an irritant, so he doesn't think people would be working for long at these levels.

**Keating** said he would bring this back with more information.

**Bates** went back to material impairment. He indicated that he just looked it up, it is essential, important, relevant. **Keating** agreed. **Owens** said that to this group, if it is an asthma attack, it is significant and important.

**Kirkham** mentioned that terms like these have been debated by the federal courts in relation to federal rulemaking and can be found in the preamble of current federal rulemaking projects.

**Eric Brown** asked if a 10% change in volume (FEV) is equivalent to an asthma attack. He does not think so. Not sure if this study is applicable to rulemaking that would move to material impairment.

**Keating** said he would look at the EPA data that Harrison mentioned, ventilation rates and how they apply to the occupational setting, and reproductive effects.

#### **Di-(2-Ethylhexyl)-Phthalate (DEHP) - Discussion**

**Keating** introduced the discussion of DEHP. HEAC had discussed DEHP in 2010 and 2012 and in one of this committee's previous meetings. Several issues brought up in that meeting were on phthalate usage in California, in what workplaces are phthalates used, and since phthalates are not particularly volatile, how and when does DEHP air contamination occur in the workplace. Keating spent some time looking into anecdotal usage by looking at specific industry categories such as medical device makers or other plastic manufacturers in the California Environmental Reporting System (CERS) data set. Keating also showed data on phthalate emissions in the Chemical Toxic Inventory (CTI) from CARB. **Forest** indicated that neither of these sources are a good reflection of usage. **Keating** agreed, but explained these are the best we have at this time. CERS seems to be the better indicator of workplace use, and **Keating** discussed several users as identified in CERS. As an example of differences, Keating mentioned that one automotive manufacturer that reported phthalate emissions in their CTI report, but did not report the same phthalate in their CERS data.

**Dan Leacox** asked if there are processes where phthalates are produced as a byproduct but are not stored. **Keating** indicated that he did not think so.

**Forest** asked if the CERS data was always reported as a maximum daily amount. **Keating** said that sometimes it is a daily average and sometimes daily maximum.

**Keating** discussed looking at data for plastisol usage as well.

**Dave Ross, Cal Trans**, asked if plastisol would be considered an article, because in federal codes they do not have to list what is in it if it is an article. **Kirkham** replied that if it is a drum of liquid it could not be considered an article. **Owens** indicated that if in the SDS the material has <1% phthalate they do not have to report it in CERS. **Keating** said that CERS may be under reporting phthalate usage.

**Janssen** stated that medical devices use DEHP. PVC-based IV bags and tubing include DEHP to make the plastic softer. Not allowed for neonatal use. Approximately 30-40% of the tubing is phthalate (DEHP in particular).

DRAFT – do not quote or cite

**Unmack** indicated that meat cutters' gloves are about 50% phthalate. **Janssen** replied that it is not unique to medical device industry. Dairy industry uses a lot of plastic tubing as well, so it is likely that a lot of PVC based plastic tubing has phthalates.

**Keating** indicated that it seems that DEHP usage is coming down and being replaced with other phthalates, but is still in use. Question is whether it is an inhalation hazard. **Janssen** commented that there were some other studies that looked at rubber workers that have high levels of DEHP, and asked if Keating had looked at those. **Keating** replied that he has not yet. This discussion is a prelude to prioritization that will be talked about in the afternoon. One criteria for prioritization is whether new significant health effects have been found and **Keating** believes that is the case with phthalates. **Keating** mentioned that the ACGIH 2019 notice of intended changes lists drop him from 5 to 0.5 mg/m<sup>3</sup> for DEHP, so believes that this is a good time to look at DEHP.

**Keating** asked the group what endpoint the committee should be looking at. **Janssen** indicated that the Consumer Products Safety Commission had done a cumulative risk assessment for phthalates, and the EPA has a draft that has not been finalized, and the National Academy of Sciences has developed a methodology to look at a particular group of phthalates that have the same mode of action.

**Harrison** asked if setting a more protective workplace standard helps drive safer substitutes because there are phthalate-free manufacturers. Phthalates are more consumer and environmentally driven right now, but if we set a lower PEL that helps to push toward phthalate free products, he would be in favor of that. But, he is also interested in who manufacturers, who uses, what products it ends up in, etc. **Janssen** indicated that the CPSC looked at this and the use of DEHP is going down and the use of DINP and DIDP is going up.

**Tom Hmiel, American Chemistry Council**, stated that the exposures shown by the CPSC for DINP were significantly lower than any of the other phthalates. DIDP and DINP were specifically looked at. DEHP is not permitted to be used in toys because there is a toy ban. By itself, DINP did not reach the level of regulation, but the CPSC decided to regulate DINP based on cumulative exposure. DIDP was determined by the CPSC to be safe, and is permitted for use in toys. DINP and DEHP have significantly different tox profiles so be cautious that when talk about phthalates that don't lump them together. There is a significant difference in toxicity when the carbon backbone is 6 carbons or lower versus 6 carbons or higher. ACC phthalates panel could provide some information on use data that could be helpful. In response to some of the previous discussion, **Hmiel** stated that there may not be CERS data from some of these users because they may be using plastic film, cutting it, and plastic film is already plasticized, so there is no inhalation exposure there. To get to an exposure, they would have to bring the plastic compound to an elevated temperature e.g. laminating, you have to get to a boiling point or at least to a temperature where get a fume because not particularly volatile.

**Peter Sholtz, DOSH**, asked about a dust exposure because of workers compounding phthalate materials. **Hmiel** replied that in some cases where you are using a dry blend, which is before its put into an extruder, there could be some exposure if there is not good dust control. This is typically the step where the dry blend is compounded before it is extruded into pellets or film. Also, when extruding or molding a part, there is elevated temperature so there can be some off-gassing there.

**Keating** asked if the ACC had commented on the ACGIH TLV reduction proposal. **Hmiel** stated that they represent higher (C9-10) level phthalates, so they did not comment on that proposal.

**Keating** wrapped up the morning session, there were no other questions or comments.

DRAFT – do not quote or cite

## **LUNCH BREAK**

### **PEL Prioritization - Discussion**

**Keating** introduced the topic of prioritization. HEAC likes to maintain a list of approximately 10 chemicals as priority 1 (P1) that the committee will address over the next HEAC cycle. It helps the Division plan internally and alerts stakeholders to the substances that will be coming up for review. SO<sub>2</sub>, benzophenone, and turpentine are the last three on the current P1 list, so the P1 list needs to be updated. The Division has some internal procedures and criteria that it applies, HESIS has some recommendations, and the Division solicits recommendations from stakeholders about substances that should be on P1.

**Keating** stated that he would introduce some chemicals today, give a quick synopsis of the reasons why they were put on the list. HESIS will explain their recommendations, and then he will open the floor for discussion. **Keating** began by reviewing the PEL prioritization handout which describes procedures for developing a list of substances for review and how substances will be ranked (see priority list handout). **Kirkham** pointed out that on the table, the absence of usage data does not mean there is no use, just that the Division has not acquired that data yet.

**Bates** asked about what the notation “10-50M” indicates on the table. **Keating** replied that it is EPA usage numbers in million pounds of chemical, and that he does not have it for every substance. **Keating** continued to review the list.

**Leacox** asked about IVF [sic] note at the end of the list. **Kirkham** answered that it is an ACGIH notation that stands for inhalable fraction vapor (IFV), that the chemical may be present as a vapor and aerosol, and it cautions that you may need to sample for both the vapor and aerosol.

**Keating** continued by presenting the proposed DOSH recommendations for P1 consideration. They included phthalic anhydride (highest ratio), butane (interesting because of its use in the cannabis industry), monochloroacetic acid (significant ratio and high usage), benzaldehyde (same), bisphenol A (BPA) or 1-bromopropane (high ratio), DEHP (current PEL based on outdated toxicology), titanium dioxide ultrafine <100nm (nanomaterial), and cyclopentadiene/dicyclopentadiene (ACGIH is adopting one TLV for both). Keating noted that a major toxicological assessment of BPA is scheduled to be released in August 2019 that would take some time to interpret, so he did not recommend putting BPA on the P1 list at this time.

**Brown** asked why benzaldehyde was recommended, was not able to find much information on it. **Keating** said it had high CERS usage and no current OSHA limit.

**Forest** asked why titanium dioxide was singled out as the nano particle to look at. **Keating** replied that it was from a NIOSH recommendation at 0.3 mg/m<sup>3</sup>. **Bob Nocco, Chevron**, added that it is listed under IARC as well. **Pinkerton** stated that TiO<sub>2</sub> was considered a nuisance dust, but now that it is ultrafine, there have been studies that show a high degree of toxicity. **Unmack** added that he believes this is getting the attention because it is a manmade ultrafine and specifically designed for high surface area. There are a lot of naturally occurring ultrafine particles as well.

**Brown** asked where diesel exhaust was. Kirkham mentioned that there is an MSHA standard and that ACGIH considered a TLV years ago but it had fallen off of their list. Also, HESIS has proposed a limit. **Forest** asked if the MSHA standard is based on carbon, because diesel exhaust is a mixture. **Kirkham** said that he believes that the MSHA is based on total carbon. **Keating** reminded that it was brought up about a year ago and it was decided then that it was too complex an issue for HEAC, so it was suggested to be put to a special committee.

DRAFT – do not quote or cite

**Harrison** asked if we have jurisdiction for benzene in upstream oil and gas, because the benzene standard exempted oil and gas. Concern is that when they open the tank hatches there can be very high readings of benzene at the top of the tanks. There was an exemption for upstream oil and gas at 10 ppm, where general industry is at 1 ppm. If that is still the case, he asked whether HEAC has any jurisdiction to review that number. **Kirkham** added that he is looking at our benzene standard and sees the 10 ppm exemption for cleaning of barges and tanks. Typically, HEAC reviews levels presented in 5155. **Harrison** indicated that this has been an issue for him that this has never been adjusted. **Stakeholder** (formerly from Chevron) asked if we have seen employers allowing employees to work in those conditions. **Harrison** replied that he has talked to several people in industry and IHs and that they say they are using the 0.5 level even though they technically do not have to. He is concerned that that is not the case across the board and it would be highly satisfying to remove that exemption.

**Harrison** asked **Keating** about whether the Division had looked back at the HESIS OEHHA report that did a systematic analysis of environmental versus occupational standards to be sure that we are not missing any P1s. **Kirkham** asked the name of the report and **Harrison** answered that it is the Sarah Hoover report on their website. **Harrison** added that he wanted us to look at any major carcinogens or reproductive toxicants on the Prop 65 list from OEHHA to see if they should be considered.

**Keating** introduced **Kashyap Thakore, CDPH/HESIS**, to present their recommendations. **Thakore** presented the hand out from HESIS that shows their recommendations for the priority list. HESIS has seven chemicals listed and provides the priority basis for these chemicals. **Thakore** mentioned that Keating has already covered three of them, BPA, 1-bromopropane, and TiO<sub>2</sub>. In addition to those three, HESIS recommends PCBTF (now being considered as a carcinogen), DIDP (is reported on prop 65 as a developmental carcinogen), and isoprene (now OEHHA has designated as a carcinogen, IARC as a 2B). **Keating** pointed out that PCBTF has particularly high usage, and asked if there has been a completed cancer study. **Thakore** replied that it has been considered by OEHHA, IARC and NTP currently, but they are waiting for final documents.

**Keating** pointed out some of the California Toxics Inventory numbers listed are not usage, but are based on stack emissions; he doesn't think one can base usage on this data. **Brown** commented that this is not research-derived, it is amounts reported to the database.

**Forest** indicated that he is a little skeptical of butane. It is a flammable and explosive hazard being used in marijuana growing, but other than flammable and explosive workplace hazards, he asked about whether there is a reason to pursue that. **Keating** said he was looking at the ACGIH STEL of 1000 ppm with a CNS endpoint, not really a chronic effect. The current 8-hour PEL is 800 ppm. **Kirkham** added that it is far below the LEL, and the ACGIH has the EX notation to indicate the risk of explosion. **Forest** stated that it doesn't seem to him to rise to the level of importance of anything on the HESIS list, or many other substances for that matter.

**Keating** stated that we would post the proposed P-1 list as soon as possible after reviewing the comments. **Forest** stated that he does not agree with the list on the screen. **Pinkerton** commented that since cannabis has been decriminalized, he knows that there are at least 10,000 farms in Humboldt County and none of the cannabis workers have much in terms of protections, so if butane is an issue and is used frequently it may deserve some attention at least for the workers in the cannabis industry. **Brown** commented that butane may not be used in the cannabis growing operations but more likely in THC extraction operations.

**Nocco** commented that a lower PEL for butane may have prevented the incidents of tank hatching that **Harrison** was referring to earlier.



DRAFT – do not quote or cite

**Mike Geyer, Kerntec Consulting**, has spent a lot of time in the agriculture industry and wanted to say that a greenhouse operation is a greenhouse operation whether it is growing flowers, strawberries, ornamental etc. it is really no different. The processing side is perhaps where the butane comes into play, not the growing operation.

**Leacox** added as a process point that we have this list that we presented and talked about so if we want to add additional substances, they need to be brought up to the committee as proposed additions before finalizing the list to give an opportunity for comment.

**Geyer** indicated that he wants additional usage data before determining priority.

**Owens** asked if we were looking at one PEL for both cyclopentadiene and dicyclopentadiene. **Keating** replied yes, that is the proposal. ACGIH is adopting one TLV for both.

**Keating** wrapped up the discussion on prioritization.

### **Wildfire Smoke- Update**

**Keating** introduced Eric Berg to give an update on the status of wildfire smoke.

**Eric Berg, DOSH**, updated the committee on wildfire smoke. There is currently a petition before the Standards Board on Wildfire Smoke. The Division staff and Standards Board staff have each drafted a response to the petition and the petition will be heard by the Board at the public meeting in Pasadena on March 21, 2019. There was also a bill introduced to the legislature to address Wildfire Smoke, using the air quality index (AQI) and would require employers to provide respirators for voluntary use. **Berg** indicated that at the next meeting the Division can give another update as to what the Board decision was.

### **Other Business**

**Keating** asked if there were any additional comments.

**Elisa Koski, Standards Board**, informed the group that she would be leading an advisory committee to look at updating 5162, the emergency eyewash and shower regulation, to update the ANSI reference from 1981 to 2014, and possibly do some other things with it. **Koski** asked if anyone was interested in being on that advisory committee and that she would leave some business cards. She is looking at around June of 2019 for putting the meeting together. She is particularly interested in people that have an opinion about how to define corrosive, toxic by absorption, or severely irritating, because those terms are used in 5162 but are not defined.

**Keating** announced that the next meeting will be June 4, 2019, and that the September 2019 HEAC meeting is cancelled so he can work with staff on preparing documents for the Standards Board. HEAC meetings will resume in December 2019. In June we hope to get closure on the P1 list so we can get started on the next group of summaries. Keating intends to come to the June meeting with more formal summaries on SO<sub>2</sub> and benzophenone.

Meeting adjourned.