



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

March 29, 2011

Supervisor Liz Kniss
Santa Clara County Board of Supervisors
70 West Hedding Street
San Jose, CA 95110

ALAMEDA COUNTY
Tom Bates
(Chairperson)
Scott Haggerty
Jennifer Hosterman
Nate Miley

Re: Dr. Singhal and Synergistic Toxicity

Dear Supervisor Kniss:

CONTRA COSTA COUNTY
John Gioia
(Vice-Chair)
David Hudson
Mark Ross
Gayle B. Uilkema

In response to your letter dated February 11, 2011, we have reviewed the letter that you received from Dr. Singhal regarding synergistic toxicity. We have researched the topic, including contacting Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA).

MARIN COUNTY
Harold C. Brown, Jr.

NAPA COUNTY
Brad Wagenknecht

SAN FRANCISCO COUNTY
John Avalos
Edwin M. Lee
Eric Mar

In accordance with California Health and Safety Code § 44360, health risk assessments (HRAs) prepared under California's Air Toxics "Hot Spots" Program, must be prepared in accordance with guidelines established by OEHHA. OEHHA's HRA guidelines were initially developed in 2003, and are updated on an ongoing basis. Notable OEHHA HRA guideline updates include revisions to the Technical Support Documents (TSDs) for Non-cancer Reference Exposure Levels, and Cancer Potency Factors, which were adopted on December 19, 2008, and June 1, 2009, respectively, to address the requirements of the Children's Environmental Health Protection Act (SB 25, Escutia 1999).

SAN MATEO COUNTY
Carole Groom
Carol Klatt

SANTA CLARA COUNTY
Susan Garner
Ash Kalra
(Secretary)
Liz Kniss
Ken Yeager

OEHHA strives to use the best scientific information available in developing their HRA guidelines. However, there is a great deal of uncertainty associated with the process of risk assessment, particularly in quantifying risks from environmental exposures, which are typically much lower than exposures addressed by animal and epidemiological studies. This uncertainty arises from lack of data in many areas necessitating the use of assumptions. The assumptions used in OEHHA's HRA guidelines are designed to err on the side of health protection in order to avoid underestimation of risk to the public. For example, the cancer potency factors used by OEHHA represent the 95th percent upper confidence limits of the slope of the dose response curve, and maximum cancer and non-cancer chronic health risks (for residents) are calculated assuming that an individual will be exposed nearly continuously over a 70-year lifetime at the location of maximum exposure.

SOLANO COUNTY
James Spering

SONOMA COUNTY
Susan Gorin
Shirlee Zane

Current OEHHA HRA guidelines make the assumption of additivity in addressing multiple chemical exposures for both cancer and non-cancer risk assessment. With respect to this assumption, OEHHA indicates (for cancer risks):

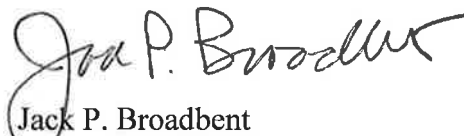
Jack P. Broadbent
EXECUTIVE OFFICER/APCO

“Cancer risks from different substances are treated additively in the Hot Spots Program in part because many carcinogens act through the common mechanism of DNA damage. However, this assumption fails to take into account the limited information on substance interactions. However, the overall uncertainty in the cancer potency factors and the variability in the human population is probably far greater than the uncertainty from the assumption of additivity. In addition, cancers are life threatening serious diseases so it is not unreasonable to consider total additive risk. Therefore, the additive assumption is reasonable from a public health point of view. (*The Air Toxics “Hot Spots” Program Guidance Manual for Preparation of Health Risk Assessments*, Aug. 2003, OEHHA).

Where there are adequate data, assessment of synergistic (greater than additive) toxicity can be conducted. For example, there is ample evidence from epidemiological studies of workers exposed to asbestos that the combination of cigarette smoking and asbestos is far more harmful than either by itself. However, to our knowledge, evidence of synergistic interactions of chemicals at the relatively low exposure levels present in ambient air currently does not exist. OEHHA indicates that the assumption of additivity is therefore most appropriate.

OEHHA staff indicates that they closely follow developments in toxicological and epidemiological research that may warrant revisions to established HRA methodologies. Nonetheless, I would encourage Dr. Singhal to share with OEHHA any technical information that she may have on assessing synergistic toxicity of environmental exposures to chemical mixtures.

Sincerely,


Jack P. Broadbent
Executive Officer/APCO