



June 9, 2010

Dr. Angela Nugent
Designated Federal Officer (DFO)
EPA Science Advisory Board (1400F)
1200 Pennsylvania Avenue NW
Washington, DC 20460

Re: Comments for the June 16 SAB Review of USEPA's "Toxicological Review of Inorganic Arsenic: In Support of the Summary Information on the Integrated Risk Information System (IRIS)"

Dear Dr. Nugent:

The following comments are focused on significant flaws in the IRIS review process regarding the cancer hazard assessment for inorganic arsenic that are widely believed to have severely compromised the scientific quality of EPA's analysis. Although these comments are provided on behalf of the Wood Preservative Science Council¹, our views are consistent with the leading researchers on arsenic carcinogenesis and EPA professional staff, who have expressed a number of serious concerns with the National Center for Environmental Assessment's analysis and the proposed change in the cancer slope factor, with one EPA Region calling it "unexpected and bewildering."

No one can argue that ensuring that any EPA assessment is based on the latest scientific information and an unimpeachable peer review process is critical. Unfortunately, as described more fully below, that is not the case with the current assessment. The process problems started with EPA's 2005 draft assessment and continued into the 2010 SAB Work Group review.

Process Problems

EPA Selectively Used Science Advisory Board (SAB) Input. In 2005 EPA requested SAB input on how to best derive a revised cancer slope factor (CSF) for inorganic arsenic. The input requested by EPA, however, was limited in scope and did not specifically request review of the calculated cancer risk value, which EPA's 2005 Draft Toxicological Review suggested was a value of approximately 5.67 per mg/kg-day (this was later confirmed by Dr. Peter Preuss in a June 29, 2009 meeting with EPA). The SAB Report, issued in 2007, responded to the limited questions in its charge from EPA. Importantly, however, the Board also provided a number of recommendations regarding additional areas EPA should consider in the on-going assessment process, including mode of action, non-linearity of the response at

¹The WSPSC is a trade association of manufacturers of wood preservatives that supports and participates in objective, sound scientific analysis of wood preservatives with a focus on chromated copper arsenate (CCA). The WSPSC is supported by its members, Arch Wood Protection, Inc., and Osmose Inc.

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low doses, evaluation of all available epidemiological studies, and careful consideration of the relevance of the Taiwan data to the US population. The SAB urged EPA to evaluate studies with low level exposures differently than those with high level exposures, such as the Taiwanese data. EPA chose to largely ignore the SAB's recommendations, resulting in the proposed CSF of 25.7 per mg/kg-day, which is a nearly 5-fold increase over the value suggested in EPA's 2005 draft report.

EPA Region 8, in an April 16, 2009 letter to the Director of the IRIS program, stated it "simply cannot support a quantitative oral slope factor based on the extremely high doses observed in the Taiwanese drinking water studies." Not only was the increase unit risk factor "unexpected and bewildering," the Region said "it didn't make any sense from an actual exposure perspective." Many experts in the scientific community consistently have expressed similar concerns about the use of high dose exposure data from Taiwan to estimate the potential effects for U.S. populations exposed to low levels of inorganic arsenic in drinking water and food. Regions 2, 3, 10 and the Office of Solid Waste and Emergency Response have also filed comments questioning the selection of the linear model for low dose exposure; several cited the absence of transparency on the model selection and slope calculation. One Region commented that the ORD science "lacks common sense;" another predicted "disastrous consequences" for EPA programs including RCRA, CERCLA, and Drinking Water.

EPA Misinterpreted Its Own Cancer Risk Guidance. The default linear model was selected because of uncertainty in the specific non-linear form of the dose-response relationship at low doses. However, to fully characterize the range of possible risks, EPA cancer risk guidance specifies that non-linear models should be considered when the mode of action, as in the case of arsenic, supports such relationships, even given some uncertainty with respect to specific mechanisms. In failing to present a full range of alternative risk models in the current arsenic CSF assessment, EPA's approach is inconsistent with its own guidance.

EPA's Assessment Ignores Recent Studies. Literally hundreds of studies in the published scientific literature have not been reviewed or evaluated by EPA in the development of its draft assessment. Of particular concern, was EPA's decision to cut-off consideration of any studies published after 2007, which seems directly at odds with EPA's stated commitment to reliance on the best available science.

Results of Essential On-Going Arsenic Research Will Not Be Used. EPA is presently engaged in extensive scientific research initiatives related to inorganic arsenic's cancer mechanism. These data are being developed under a long-established Memorandum of Agreement with the Electric Power Research Institute and are critical to the current assessment. Additional on-going and highly relevant research on the mechanism, such as that conducted by Dr. Sam Cohen at the University of Nebraska, will be available in 2010 and should also be considered.

EPA's Narrow Charge Ensured No Substantive Changes by the 2010 SAB Work Group. The April 2010 SAB Work Group's review focused on how well EPA implemented certain key recommendations from the 2007 SAB report. The public comments provided during the meeting, which raised serious scientific limitations with EPA's approach and assumptions, were received politely by the Work Group, but given no real consideration. Even a letter from five members of the 2007 SAB² that pointed out where EPA ignored several of its key recommendations, was effectively dismissed. The

² March 25, 2010 letter to Dr. Sue Shallal, DFO, regarding: "Comments Submitted to the Workgroup of the Chartered Science Advisory Board upcoming review (on April 6-7, 2010) of the USEPA draft "Toxicological Review of Inorganic Arsenic in Support of Summary Information on the Integrated Risk Information System (IRIS). February 2010".

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Work Group could certainly have turned its attention to the substantial limitations in EPA's assessment articulated by the public speakers, but it was clear from the tight schedule that it needed every minute to address the implementation issues in its charge and there was not much time or will to stray into other topics. When will EPA respond to the SAB's recommendations and conduct a comprehensive review of the scientific choices and judgments it made in its 2005 draft assessment?

The 2010 SAB Work Group Was Not Provided All of the Public Comments. Following the 2010 SAB Work Group meeting we learned from Kevin Bromberg, Assistant Chief Counsel for Advocacy at the U.S. Small Business Administration, that the Work Group may not have received all of the submitted public comments prior to its April meeting because the National Center for Environmental Assessment (NCEA) issued its own Federal Register notice that indicated all public comments sent to the EPA docket would be provided to the SAB. Vanessa Vu, SAB Director at EPA, was not aware of the language in the Federal Register notice from NCEA; furthermore, because it is an independent advisory body, the SAB has an independent and separate process for receiving public comments that asks the public to submit its comments to the SAB Designated Federal Officer for SAB consideration. Dr. Vu indicated that all of the public comments should have been submitted to the SAB directly to avoid any confusion with the other EPA public comments process.

EPA's Hazard Assessment is Not Consistent with Other Scientific Assessments of Potential Exposure and Cancer Risk Associated with Arsenic

The Agency for Toxic Substances and Disease Registry's (ATSDR) toxicological profile on arsenic³ raises uncertainty with EPA's current assessment. Based on ATSDR's comprehensive review of the literature it found that "Studies of U.S. populations have not identified an increased risk of bladder or respiratory tumors following oral exposure to inorganic arsenic." (pages 22-23). ATSDR also reported that the current view regarding the carcinogenic mechanism for inorganic arsenic is its function as a promoter or co-carcinogen (pages 276-277). This mode of action has a non-linear dose-response relationship, with the potential for a threshold effect.

The Centers for Disease Control and Prevention's (CDC) "Fourth National Report on Human Exposure to Environmental Chemicals"⁴ included biomonitoring data on speciated arsenic in urine for the first time. The CDC results indicate that the 95th percentile of the U.S. population for the sum of urinary arsenic species was low, and well below the American Conference of Governmental Industrial Hygienists occupational biologic effect index (BEI), which is a measure of exposure to inorganic where nearly all workers may be repeatedly exposed without adverse health effects⁵.

Conclusion and Recommendation

These comments summarize a number of serious problems in the IRIS review process used for the inorganic arsenic cancer hazard assessment and call into question the quality and peer review of the complex scientific decisions made by EPA. We are disappointed that the SAB did not hold EPA to

³ "Toxicological Profile for Arsenic", U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, August 2007.

⁴ "Fourth National Report on Human Exposure to Environmental Chemicals", U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2009.

⁵ American Conference of Government Industrial Hygienists (ACGIH). Documentation of biological exposure indices. 7th edition. Cincinnati (OH): ACGIH Worldwide; 2001.

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completing the more thorough scientific review and quantitative analyses called for by the SAB in its 2007 report to EPA. A number of EPA Regions, the Office of Solid Waste and Emergency Response, arsenic researchers, and the regulated community have also submitted comments questioning EPA's assessment and requesting that the Agency complete the more thorough scientific review and quantitative analyses called for by the SAB. Although the April 2010 SAB Work Group review adequately addressed the questions in its charge from EPA, the Work Group was not asked to comment on many of the key issues and limitations in EPA's assessment.

We request that the SAB require EPA to fully address the recommendations provided by the SAB in its 2007 report, and for the Agency to incorporate the results of on-going research on the mechanism of arsenic carcinogenicity so that EPA's IRIS hazard assessment reflects the best available science regarding the potential cancer risk for the U.S. population from exposure to inorganic arsenic.

Sincerely,

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