



The Dow Chemical Company
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July 7, 2010

VIA EMAIL AND INTERNET SUBMISSION

Dr. Thomas Armitage
Designated Federal Officer
EPA Science Advisory Board Staff Office
Mail Code: 1400F
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

**Re: Docket ID No. EPA-HQ-ORD-2010-0395
Submission of Preliminary Comments for
SAB Dioxin Review Panel Meeting**

Dear Dr. Armitage:

We are submitting the attached document as written preliminary comments in support of the SAB dioxin review panel meeting. Please treat this submission as fulfilling the requirements of the May 24, 2010 Federal Register notice to reserve the opportunity to submit oral comments at the SAB Panel Review meetings scheduled for July 13 – 15.

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PRELIMINARY COMMENTS OF THE DOW CHEMICAL COMPANY
FOR THE
PUBLIC MEETING OF THE SAB DIOXIN REVIEW PANEL

75 Fed. Reg. 28805 (May 24, 2010)
Docket ID No. EPA-HQ-ORD-2010-0395

July 7, 2010

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The Dow Chemical Company (“Dow”) appreciates the opportunity to present these initial comments on the “Draft Reanalysis of Key Issues Related to Dioxin Toxicity and Response to NAS Comments” (the “draft Reanalysis”), published by the U.S. Environmental Protection Agency (“EPA” or “the Agency”) in the May 21, 2010 Federal Register. 75 Fed. Reg. 28610. These comments are submitted to comply with the deadline EPA has established for submitting comments that will be furnished to the Science Advisory Board (“SAB”) expert peer review panel for its July 13-15 public meeting on the draft Reanalysis. However, because of the very limited time made available for submission by that deadline of comments on the lengthy and technically complex draft Reanalysis, these comments are only preliminary. Dow intends to submit additional comments by the September 20, 2010 close of the comment period for the Reanalysis.

These comments address both process-related and substantive issues. Dow also endorses and incorporates by reference the comments being submitted by the American Chemistry Council (the “ACC Comments”) and the General Electric Company, the latter of which focus on toxicity equivalency factor (“TEF”) issues.

Process-Related Comments

In its May 21, 2010 Federal Register notice, EPA stated that the draft Reanalysis will proceed under the revised IRIS process announced by EPA Administrator Jackson in May 2009. EPA indicated that the draft Reanalysis starts Step 4 of that process - independent external peer review and public review and comment. Although Step 4 provides for a minimum 60 day public comment period on draft risk assessments and a public meeting no sooner than 10 working days after peer reviewers have been provided public comments received by the close of that comment period, the process established for the draft Reanalysis has required commenters to submit their comments for purposes of the SAB’s July 13-15 public meeting within 47 days of the commencement of the comment period, and provides that the SAB peer reviewers will receive those comments only six calendar days before the July 13 public meeting. Both of these results are inconsistent with Step 4 of the IRIS process and give short shrift to the importance evident in the IRIS process of an adequate opportunity for (i) public comment before peer reviewers convene their public meeting, and (ii) peer reviewers to review and evaluate those comments before they commence their public deliberations over draft risk assessments. This is particularly the case where the public has only 47 days to review a highly technical document covering a wide range of complicated scientific topics in over 1,800 pages that EPA took four years to produce following the release of the NAS report in 2006.

EPA has now extended the public comment period on the draft Reanalysis to September 20, and participants at the June 24 teleconference on the Reanalysis were informed that the SAB peer review panel would convene a second public meeting sometime in the fall to further address public comment. The process conducted for the Reanalysis should be consistent with both the letter and the objective of the IRIS process, which is aimed at realizing the full benefit of public comments and informed peer review of draft risk assessments *before* they move forward. Thus, EPA and the SAB peer review panel should proceed as follows:

- (i) given the severely circumscribed time the SAB will have had to review both the 1,800 page draft Reanalysis and necessarily limited public comment on it, the July 13-15

public meeting should focus on initial information-gathering and identification of the key issues that the expert peer reviewers should address going forward, including clarification of existing EPA charge questions and an examination of any additional questions the panel believes should be analyzed in light of the content of the draft Reanalysis and the National Academy of Sciences recommendations and criticisms to which it is responding;¹

- (ii) to ensure that the SAB peer review panel has sufficient time to adequately consider extensive and technical comments on this highly controversial draft risk assessment before attempting to resolve the issues before the panel, the public meeting in the fall should not commence before the end of October, 2010;
- (iii) to enhance the technical input brought to bear on the complex issues addressed in the draft Reanalysis, opportunities should be provided for the SAB panel to engage experts critical to the panel's scientific deliberations during the period between the July and Fall public meetings; and
- (iv) in light of the complexity and range of the draft Reanalysis and the significant public interest in it, members of the public should be provided up to 30 minutes for oral presentations at the fall public meeting.

Substantive Comments

EPA's draft dioxin reassessment has had a lengthy and highly controversial history. Two factors have contributed significantly to that result. First, EPA seemingly has largely ignored the informed scientific advice proffered it by two previous Science Advisory Board panels and now, with the draft Reanalysis, a National Academy of Sciences ("NAS") panel of dioxin and risk assessment experts.² Second, the Agency has chosen not to account for a body of new credible scientific information highly relevant to dioxin risk characterization that is at odds with EPA's position on the toxicity and bioavailability of dioxin. These actions fly in the face of EPA's commitment to scientific integrity in risk assessment decisionmaking and to the importance of

¹ Given the nature of the draft Reanalysis, it would be unreasonable and unwise to expect that by July 13, the peer reviewers would have had sufficient time to (i) review and analyze critically both the 1,800 page draft Reanalysis and public comments filed on it by July 7, (ii) evaluate that information against the charge questions, (iii) investigate the underlying scientific publications in a responsible weight-of-evidence assessment, and (iv) prepare and discuss meaningful conclusions. Clearly, then, any effort by the SAB panel at the July 13 public meeting to move toward a consensus on a response to the EPA charge questions would be premature.

² In comments submitted in connection with the June 24, 2010 teleconference for the draft Reanalysis, two members of the NAS panel that reviewed EPA's 2003 draft reassessment (Allen Silverstone of the State University of New York and Joshua Cohen of Taft New England Medical Center) stated that the draft Reanalysis either ignored or failed to address adequately key NAS recommendations.

public and peer review comment in informing that decisionmaking. They also are inconsistent with the commitment EPA has made in its Information Quality Act guidelines to ensure use of best available peer-reviewed science and “weight-of-the-scientific evidence” evaluations to maximize the objectivity and utility to end-users of influential scientific information that, like the dioxin reassessment, has a clear and substantial impact on important public policies or private sector decisions. The peer review process established for the draft Reanalysis provides a timely and substantial opportunity to address and hopefully rectify these significant scientific shortcomings.

The ACC comments provide a useful summary of the principal ways in which the draft Reanalysis fails to reflect (i) a robust response to the 2006 NAS criticisms of, and recommendations regarding, EPA’s draft 2003 draft dioxin reassessment, and (ii) an objective analysis and weighing of all best available peer-reviewed science on dioxin toxicity. Dow offers the following additional technical comments:

- Despite its commitment to do so, EPA has failed to apply a robust “weight-of-evidence” process for deriving qualitative and quantitative toxicity values. For example, EPA has claimed that there is no known Mode-of-Action (“MOA”) for how TCDD causes cancer, and uses this position to reject a non-linear basis for the cancer potency derivation. EPA did so with only a cursory weight-of-the-evidence MOA evaluation of the published data. At the same time, EPA adopted a MOA position to justify classifying TCDD as a known human carcinogen and for modeling all cancer mortality. These two positions are contradictory, and EPA has failed to reconcile the contradiction. As another example, in evaluating the non-cancer data sets, EPA did not acknowledge and address in an appropriate weight-of-evidence evaluation a number of other credible studies of thyroid hormone that are available and that impact the RfD derivation (as discussed in the ACC Comments). In finalizing the Reanalysis, the Agency should follow its own IQA guidelines, as well as its *2005 Guidelines for Carcinogenic Risk Assessment*, *2004 An Examination of Risk Assessment Principles and Practices*, and *2000 Risk Characterization Handbook*, and conduct appropriate, robust, and transparent weight-of-evidence assessments. The SAB peer review panel should provide EPA input on where and how these assessments should be undertaken.
- To ensure a scientifically defensible final dioxin Reanalysis and reassessment, EPA needs to correct certain modeling errors and assumptions it has made in the use of the Seveso thyroid and sperm data. While the Agency’s use of these two studies represents a meaningful improvement over its previous misplaced and problematic reliance upon rodent studies, EPA has not conducted a robust weight-of-evidence evaluation of the scientific information relevant to the Agency’s proposed RfD values. As a result, modifications must be made to EPA’s interpretation of the Seveso studies to more accurately reflect the relationship between 2,3,7,8-TCDD exposure and the measured clinical end-points. The ACC Comments address this issue further.
- As the ACC Comments also describe in more detail, EPA must provide a non-linear cancer potency assessment for dioxin in order to be responsive to the NAS

panel's recommendations. The NAS clearly concluded that there was ample scientific justification for a non-linear (threshold) cancer dose-response assessment, and just as clearly recommended that EPA conduct one. The Agency's assertion that there is no known Mode-of-Action ("MOA") is belied by the weight-of-scientific evidence and expert opinion, which clearly identify dioxins as possessing a tumor promoter MOA that the rest of the scientific community, including scientists from the World Health Organization ("WHO"), has concluded is threshold in nature. EPA's dogged and singular pursuit of a linear approach reflects a policy judgment that is not justified in light of best available science on dioxin toxicity.

- To establish a scientifically credible cancer slope factor, EPA must correct modeling approaches it used in deriving the linear cancer slope factor from the National Institute of Occupational Safety and Health ("NIOSH") all-cancer mortality results published in one study, Cheng et al. (2006). More information on this shortcoming is being provided by Dr. Lesa Aylward as part of the ACC Comments. In addition, the SAB should carefully consider whether there is sufficient scientific support for assuming that TCDD can promote any and all types of cancer in humans, as this is a critical assumption used in modeling the relationship between occupational TCDD exposure and cancer.
- Inexplicably, EPA has chosen to ignore the recommendations of the NAS panel concerning the use and application of TEFs. Instead, the Agency has simply elected to adopt the 2006 WHO TEF values without weighing and responding in a thoughtful fashion to the recommendations of the NAS panel that EPA address thoroughly the limitations and uncertainties of the TEF methodology currently employed. In its 2006 report, the NAS recommended that: ". . . as a follow-up to the Reassessment, [the EPA should] establish a task force to begin to address this uncertainty by developing consensus probability density functions for TCDD, other dioxins and DLCs. The committee recommends that EPA clearly address TEF uncertainties in the Reassessment." Because the majority of dioxin-like exposures from food and environmental media do not come from 2,3,7,8-TCDD, it is imperative that TEFs be employed in a fashion that is highly defensible based on all best available science.
- The draft Reanalysis also does not adequately address significant NAS recommendations regarding exposure to dioxin. In the absence of a robust, scientifically justifiable response to those recommendations (which should also be peer-reviewed by external reviewers), a final reassessment of the human health risks of dioxin will not reflect best available peer-reviewed science.
- As highlighted in comments filed during the interagency review process, EPA's charge questions are unduly circumscribed, and the SAB peer review panel should not be constrained by them. The ACC comments identify additional charge questions that should be addressed to ensure an EPA response that is faithful to the full range of NAS criticisms and recommendations.

In conclusion, EPA, the NAS and SAB, and other interested parties have engaged in a lengthy effort to ensure that a final dioxin reassessment is based on sound and current scientific information. The expertise of the SAB peer review panel will play a pivotal role in bringing that effort to fruition. Accordingly, the panel's input to EPA should be determined and provided only after the panel has had an ample opportunity to evaluate the technically complex and wide-ranging draft Reanalysis in light of public comment on it, which will bring to bear expert opinion on dioxin toxicity, use of TEFs, and other issues. The panel's recommendations should ensure that EPA has provided a robust and scientifically sound response to all the 2006 NAS recommendations based on a weight-of-evidence evaluation that accounts for all best available science consistent with EPA IQA and other risk assessment guidelines.