

**Summary Minutes of the  
U.S. Environmental Protection Agency (EPA)  
Science Advisory Board (SAB)  
Ecological Processes and Effects Committee Meeting  
February 9, 2006**

Committee Members: See Roster – Appendix A

Date and Time: Thursday, February 9, 2006, 9:00 a.m. – 2:30 p.m.

Location: EPA Science Advisory Board Conference Center, 1025 F Street, N.W.,  
Suite 3705, Washington, D.C.

Attendees:

SAB Ecological Processes and Effects Committee

Chair: Dr. Virginia Dale

Members: Dr. Richelle Allen-King  
Dr. Allen Burton  
Dr. Wayne Landis  
Dr. Lawrence Master  
Dr. Judith Meyer  
Dr. Michael Newman  
Dr. Thomas Mueller  
Dr. James Oris  
Dr. James Sanders  
Mr. Timothy Thompson  
Dr. Ivor van Heerden

Other SAB Members: Dr. Gregory Biddinger

EPA SAB Staff: Thomas Armitage, Designated Federal Officer  
Anthony Maciorowski, Associate Director, EPA  
Science Advisory Board Staff Office  
Vanessa Vu, Director, EPA Science Advisory  
Board Staff Office  
Ron Josephson, EPA Science Advisory Board Staff  
Office

Other EPA Staff: Glenn Suter, EPA Office of Research and  
Development (EPA Liaison to SAB EPEC  
Workshop Steering Committee)

Others Present: Pat Casano, General Electric  
Greg DeCowski, Delaware Department of Natural  
Resources and Environmental Control  
Russell Dinnage, PTCN  
Miranda Henning, Environ International Corp.  
Kristen Thornton, Delaware Department of Natural  
Resources and Environmental Control

### **Meeting Summary**

The discussion followed the issues and timing as presented in the meeting agenda (Appendix B)

### **Convene Meeting, Call Attendance**

Thomas Armitage, Designated Federal Officer (DFO) for the Ecological Processes and Effects Committee (EPEC) opened the meeting at 9:00 a.m. He stated that the meeting was being held under the requirements of the Federal Advisory Committee Act and that the Committee had complied with federal ethics and conflict-of-interest laws. Armitage stated that, as DFO he would be present during Committee business and deliberations. He stated that records of Committee discussions are maintained and summary minutes of the meeting would be prepared and certified by the Committee Chair. Armitage then asked the Committee members to identify themselves and their affiliations.

### **Purpose of the Meeting and Review of the Agenda**

Virginia Dale, Committee Chair, reviewed the agenda for the meeting. She stated that the purpose of the meeting was to discuss the products that would be developed by the Committee to document the proceedings of the EPEC ecological risk assessment workshop that had been held during the previous two days, and provide recommendations to EPA. Dr. Dale suggested that the Committee should develop several products: 1) a summary document of the workshop proceedings, 2) workshop papers to be published in the peer reviewed literature, and 3) a report to EPA containing the Committee's recommendations. Dr. Dale stated that she would like to discuss these products and develop a draft outline of the Committee's report.

### **Discussion of the Ecological Risk Assessment Workshop Products**

The Committee discussed the format of the workshop products and the timing of their development. A member suggested that the proceedings might first be written and then the committee report could be developed. The Chair noted that the Committee's report to the EPA Administrator should contain big picture recommendations. She noted that SAB staff could develop a workshop summary document from material provided by the workshop rapporteurs. This summary document could be reviewed by the Committee and used to develop the report.

Another Committee member noted that the products should be written for different audiences. The workshop summary document should be available on the SAB website and be written for a broad audience of people interested in the details of the discussion at the workshop. The Committee report should be written to provide recommendations to EPA. Committee members decided that: 1) the detailed description of the workshop discussions should be called a “workshop summary” document, not a proceedings document and that this would be prepared by SAB Staff, this document should be reviewed by Committee members, 2) the Committee should focus on developing the report that would be sent to the Chartered SAB for transmittal to the EPA Administrator, 3) the purpose of the report should be to inform EPA and suggest opportunities for improving the practice of ecological risk assessment. A cover letter and executive summary will be included with the report. A committee member indicated that it would be useful to make the report available to EPA Regional risk assessors and states.

The Committee discussed the development of workshop journal articles for publication in the peer reviewed literature. The Chair stated publication of the articles would make the workshop results available to risk assessment practitioners and noted that there are many journals that focus on risk assessment. The Chair also noted that when workshop speakers were invited, they were asked to consider preparation of the following articles: 1) an article on the history of ecological risk assessment, 2) articles on the strengths and weaknesses of ecological risk assessment, 3) an article addressing EPA’s implementation of ecological risk assessment, 4) an article discussing the future of ecological risk assessment and opportunities to improve the practice. Members discussed whether the papers should focus on the “North American context for risk assessment” and whether the papers should be integrated. Members suggested that there should be “touch points” linking the papers. A member suggested that it might be helpful to discuss implementation of ecological risk assessment from a broad perspective (i.e., beyond North America)

Another member stated that he liked the idea of four articles but that it would be difficult to focus on ecological risk assessment beyond the U.S. implementation of ecological risk assessment is different in other countries. The member suggested that a comparative analysis of risk assessment practices might be provided in a fifth paper. The member suggested that one of the published papers could include introductory material indicating that the papers were being written from the perspective of risk assessment in the U.S. People who had not been involved in the workshop could be invited to write additional papers addressing the practice of ecological risk assessment in other countries.

Other members stressed the importance of writing articles for the broader audience of ecologists rather than only risk assessors. The Committee discussed journals that might publish the articles. A member suggested that the articles might be published in *Coastal Resources*. The Chair suggested that the articles might be published in *Ecological Applications*. A member stated that all four papers, along with an overview paper, should be published in one journal. Another member stated that *Ecological Applications* may not want to publish all of the articles, he suggested that the articles be published in

*Integrated Environmental Assessment and Management*. He stated that many risk assessment practitioners read this journal. Members suggested other journals for submission of the papers including: *Environmental Science and Technology*, *Science Policy Papers*, *Frontiers in Ecology*, *Human Health and Ecological Risk Assessment*, *Nature*, and *Science*. A member suggested that a “teaser” article could be published in *Science*. After further discussion the Committee decided that the articles would be submitted to *Integrated Environmental Assessment and Management* for publication and that they would focus on ecological risk assessment in the U.S. A member noted that the Committee would have to consider how address the issue of page charges for the articles.

The Chair then asked if there were any public comments on the topics discussed during the morning. There were no public comments.

At 11:00 a.m. the Chair recessed the committee for a 15 minute break and stated that after the break she would like to begin developing a draft outline of the Committee report.

### **Development of Draft Committee Report Outline**

The Committee developed a draft outline of the report to EPA (the draft outline is included in Appendix C). The Committee continued discussion of the outline during a working lunch from 12:00 – 12:45. The Chair then stated that the Designated Federal Officer should send the outline to all of the Committee members and asked that they insert more detailed bullets into each section.

### **Discussion of Next Steps to Develop Workshop Products**

Committee members identified and discussed a number of issues that could be addressed in the Committee report. A member noted that it is important to consider how cost/benefit analysis is used in the process of risk assessment and the need for transparency in the process. Another member noted the importance of making sure that the practice of risk assessment keeps up with the science of ecology.

A member stated that the Committee had previously considered holding two ecological risk assessment workshops. He noted that many of the issues discussed at the workshop held during the preceding two days had focused on the process of risk assessment and management (e.g., scale issues, problem formulation, use of testable hypotheses, and decision-making in the presence of uncertainty). He noted that another workshop could be held to focus on other science issues, and to address how new science can be used by the risk assessment community.

Another member noted that the vast majority of EPA regulatory decisions are made on the basis of human health risk or economics. He stated that the public and decision-makers must be educated about the importance of ecology and ecological risk.

The Chair stated that it might be useful to identify the 8-10 most important issues and focus the recommendations to EPA on these issues. Another member suggested that case studies might also be developed.

A member stated that it is important to consider the “weight of evidence” issue. He noted that the use of weight of evidence in ecological risk assessment is currently subjective and qualitative. He stated that, in addition to discussing the use of new ecological tools, the Committee report should identify general rules for using weight of evidence in an assessment. A member stated that one of the biggest issues to be addressed is how to raise the status of ecology within EPA. She stated that the EPEC needs to think about how ecology can become more important in the EPA decision-making process. She noted that this could be discussed at the next EPEC meeting in the fall, after the workshop summary document has been developed and work has begun on developing the report.

The Chair summarized the issues that were discussed by members: these included: 1) communicating the science, 2) comparison of ecological risk associated with alternatives and net benefit analysis, 3) involving more ecology in the application of ecological risk assessment (i.e., new ideas from ecology), 4) “cognition to decision-makers” (i.e., how methodologies fit into the risk assessment process, 5) changing decision makers’ perspectives so that ecology is considered, 6) how to apply weight of evidence in ecological risk assessment.

A member noted that in deciding which issues to address the Committee should consider the timeline for developing advice to the Administrator.

The Chair then stated that she wanted to continue discussing how the Committee’s report to EPA could be developed. She noted that the workshop had provided material for further development. She suggested that the following themes might be considered in developing the report: 1) the success of ecological risk assessment, 2) opportunities that are not part of the current practice of ecological risk assessment, 3) setting the goals of risk assessment in the appropriate spatial and ecological context, 4) the need to bring better knowledge of ecology in to the process, 5) the need to consider proactive measures in an assessment, 6) the need to strike a balance between innovation and standardization, 7) the need for communication.

A member suggested that the report might be developed by using the workshop breakout group topics as an organizing framework. Another member suggested that the report would be more readable if cross-cutting topics were addressed in some format. Another member stated that the outline developed by the Committee provided the major overarching themes that would be in the report, but commonalities should be pulled out in a summary discussion. A member supported the idea of identifying themes but stated that too many themes should not be addressed in the report. He suggested that it might be appropriate to choose approximately five themes. Another member suggested that the themes be discussed in a cross-cutting way. The Chair stated that the best way to proceed

would be for members to insert detailed bullets into the draft outline sections and return them to the DFO for compilation.

The Committee then discussed a timeline for developing the report. The Chair stated that the DFO would send summary notes from each of the workshop breakout groups to members of the Committee who participated in those sessions along with the draft report outline. She asked that members insert bullets into the outline and return it to the DFO within one month so that the information could be compiled. The Chair stated that she would like to make lead writing assignments after the information had been compiled, and that a conference call would then be scheduled, preferably in April, to discuss the outline and assignments. Before the conference call, a “straw man” outline including key bullets provided by members in each of the outline sections would be prepared and sent to Committee members. The DFO would also prepare a draft workshop summary document and send it to Committee members for review.

The Committee then discussed how the EPEC might want to consider developing this topic beyond the report. A second workshop was discussed and members decided that it would be appropriate to consider holding a second workshop, or EPEC meeting on the topic of ecological risk assessment, after the workshop summary document and Committee report were further developed.

At the conclusion of this discussion, the Chair then thanked the Committee members for their input, stated that they would soon be receiving the workshop notes and draft outline for additional input, and adjourned the meeting at 2:30 p.m.

Respectfully Submitted:

Certified as True:

*/Signed/*

*/Signed/*

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Dr. Thomas M. Armitage  
Designated Federal Officer

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Dr. Virginia Dale  
Panel Chair

## **APPENDICES**

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Appendix A: Roster of SAB Ecological Processes and Effects Committee

Appendix B: Meeting Agenda

Appendix C: Draft Outline of Committee Report on Ecological Risk Assessment

## Appendix A – Committee Roster

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### **U.S. Environmental Protection Agency Science Advisory Board Ecological Processes and Effects Committee**

#### **CHAIR**

**Dr. Virginia Dale**, Corporate Fellow, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN

#### **MEMBERS**

**Dr. Richelle Allen-King**, Associate Professor of Geology, University at Buffalo, Buffalo, NY

**Dr. G. Allen Burton**, Professor and Director, Institute for Environmental Quality, Wright State University, Dayton, OH

**Dr. Ivan J. Fernandez**, Professor, Department of Plant, Soil and Environmental Sciences, University of Maine, Orono, ME

**Dr. Wayne Landis**, Professor and Director, Institute of Environmental Toxicology, Western Washington University, Bellingham, WA, USA

**Dr. Lawrence L. Master**, Chief Zoologist, NatureServe, Boston, MA

**Dr. Judith L. Meyer**, Distinguished Research Professor, Institute of Ecology, University of Georgia, Athens, GA

**Dr. William Mitsch**, Professor, Olentangy River Wetland Research Park, The Ohio State University, Columbus, OH

**Dr. Thomas C. Mueller**, Professor, Department of Plant Sciences, University of Tennessee, Knoxville, TN

**Dr. Michael C. Newman**, Professor of Marine Science, School of Marine Sciences, Virginia Institute of Marine Science, College of William and Mary, Gloucester Point, VA

**Dr. James Oris**, Professor, Department of Zoology, Miami University, Oxford, OH

**Dr. Charles Rabeni**, Leader, Missouri Cooperative Fish and Wildlife Research Unit,  
U.S. Geological Survey, Columbia, MO

**Dr. James Sanders**, Director, Skidaway Institute of Oceanography, Savannah, GA

**Mr. Timothy Thompson**, Senior Environmental Scientist, Science, Engineering, and the  
Environment, LLC, Seattle, WA

**Dr Ivor van Heerden**, Associate Professor & Director, Department of Civil and  
Environment Engineering, LSU Hurricane Public Health Research Center, Louisiana  
State University, Baton Rouge, LA, USA

**SCIENCE ADVISORY BOARD STAFF**

**Dr. Thomas Armitage**, Designated Federal Officer, Washington, DC,

## Appendix B – Meeting Agenda

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### SCIENCE ADVISORY BOARD

**Ecological Processes and Effects Committee (EPEC)**

**SAB Conference Center**

**1025 F Street, N.W., Suite 3705, Washington, D.C. 20004**

**February 9, 2006, Public**

### AGENDA

- 9:00 a.m.            **Meeting Convened by the Designated Federal Officer**  
Dr. Thomas Armitage
- Purpose of the Meeting and Review of Agenda**  
Dr. Virginia Dale, Chair
- 9:15 a.m.            **Discussion of Ecological Risk Assessment Workshop Products**  
Dr. Virginia Dale, EPEC and Workshop Steering Committee  
Members
- Discussion of Project Plans and Next Steps**  
Dr. Virginia Dale and Committee Members
- 11:00 - 11:15 a.m.    **BREAK**
- 11:15 - 12:00 p.m.    **Develop Ecological Risk Assessment Workshop Proceedings**
- 12:00 - 12:45 p.m.    **LUNCH**
- 12:45 - 2:15 p.m.    **Develop Ecological Risk Assessment Workshop Proceedings**
- 2:15 - 2:30 p.m.      **Review Assignments and Next Steps**  
Dr. Dale and Committee Members
- 2:30 p.m.            **Adjourn**

## Appendix C Draft Outline of Ecological Risk Assessment Report to EPA

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### Outline of SAB Ecological Processes and Effects Committee Report to EPA on Ecological Risk Assessment

1. Introduction
  - 1.1. Workshop (what, why, how, who, structure)
  - 1.2. History
  - 1.3. EPA experience
2. Scales as a Driver of Ecological Risk Assessment
  - 2.1. Spatial boundaries (endpoints to be valued, natural breaks in the environment, geopolitical boundaries, land use)
  - 2.2. Temporal scales
  - 2.3. Biological scales
  - 2.4. Constraints (money, resources, regulatory program transparency)
3. Problem Formulation
  - 3.1. Critical steps
  - 3.2. Peer review after problem formulation
  - 3.3. List of factors to consider (e.g., the EPEC essential ecological attributes)
  - 3.4. Involving stakeholders
  - 3.5. Creating a checklist for reviewers
4. Improving the Science of Ecological Risk Assessment
  - 4.1. Cumulative effects
  - 4.2. Statistical design
  - 4.3. Terminology
  - 4.4. Scales
  - 4.5. Peer review
  - 4.6. Ecology
  - 4.7. Toxicology
  - 4.8. Data consistency and quality
  - 4.9. Evaluation of methods
5. Uncertainty
  - 5.1. How to communicate uncertainty
  - 5.2. Acceptable levels of uncertainty
  - 5.3. Quantifying uncertainty
  - 5.4. Separating variability from uncertainty
  - 5.5. Perspective of risk managers vs. risk assessors

- 5.6. Database and repository as a way to reduce uncertainty (analogous to EPA Integrated Risk Information System – IRIS)
6. Decision Making
  - 6.1. Net environmental benefit
  - 6.2. Cost benefit
  - 6.3. Tools
  - 6.4. Weight of evidence
  - 6.5. Likelihood arrays
  - 6.6. Decision-making with multiple decision-makers
7. Management in the Ecological Risk Assessment Context
  - 7.1. Adaptive management
  - 7.2. Iteration
  - 7.3. Monitoring
8. Communication
  - 8.1. Involving social scientists
  - 8.2. Critical junctures for communication
  - 8.3. Who communicates to whom
  - 8.4. Modes of communication (e.g., web-based tools and training modules)
9. Learning from Ecological Risk Assessment Successes and Failures
  - 9.1. Capacity building
  - 9.2. Standards of practice
  - 9.3. Case studies
  - 9.4. Evaluation (linking risk to performance)
  - 9.5. Tapping and adapting existing data and methods
  - 9.6. Cost effectiveness of risk assessment
  - 9.7. Proactive risk assessment for emergency response
10. Special Issues Concerning Particular Types of Ecological Risk Assessments
  - 10.1 Contrasting risk assessments for: product use, contaminated sites, and natural resources management (table of similarities and differences)
  - 10.2 Reactive vs. proactive risk assessments
11. Other
12. Summary Recommendations