

EPA Office of Solid Waste and Emergency Response (OSWER) Office of Resource Conservation and Recovery (ORCR) Science Integration for Decision Making Fact-Finding Interviews

November 24, 2009

Washington, DC

Three members of the SAB Committee on Science Integration for Decision Making interviewed the Chief and Staff of ORCR's Economics and Risk Analysis Staff and the OCRC Director: Drs. James Bus and James Johnson in person and Dr. Catherine Kling by telephone. Dr. Angela Nugent, Designated Federal Office for the committee, provided a brief introduction to the purpose of the interview. She also took notes to develop a summary of the conversation. All interviewees were provided a copy of the committee's Preliminary Study Plan in advance.

Dr. Nugent noted in each interview that the purpose of the interview was to help SAB Committee members learn about ORCR's current and recent experience with science integration supporting EPA decision making so that the SAB can develop advice to support and/or strengthen Agency science integration efforts. Dr. Nugent thanked participants for taking time for the interviews.

Interview with the Economics and Risk Analysis Staff

Participants:

Dr. Lee Hofmann, Chief, Economics and Risk Analysis Staff

Mr. Lyn Luben, Chief Economist, Economics and Risk Analysis Staff

Ms. Becky Cuthbertson, Risk Assessor, Economics and Risk Analysis Staff

Staff members began the discussion by describing how science integration happens, given their job function, and how science is integrated into decisions. One member noted the strong presence of risk assessment and economic considerations in regulatory activity; science was less of a factor for ORCR's non-regulatory activities. Staff noted that science is important to convince the public of the benefits of EPA actions and then noted that science is only one factor among many that influence EPA's decisions. Political, legal, and environmental justice considerations also play a role. Program staff who write regulations lead inter-disciplinary work groups and typically manage the decision making process from beginning to end. They consider Economics and Risk Analysis Staff 's input, other scientific input (including waste characterization, chemical analysis, and engineering), in addition to nonpolitical factors.

The economic analysis builds on a multi-disciplinary base. Economists use information on engineering options, human health and ecological risk, and costs to generate a social cost and benefit analysis.

Time pressures, limitations of data, and budget limitations are the principal factors that prevent scientists from fully integrating the science and following some of the valuable recommendations in SAB and National Research Council reports. Often there are "false negatives" generated by the science, but it is difficult to address them effectively when a program must be implemented or a decision made. Stakeholders sometimes provide data that

lead decisions to change in major ways. Politics also comes into play and "that changes everything."

To address science issues, the staff typically uses in-house expertise or relies on contractors. At times, the Office of Research and Development provides expertise, but ORD assists fairly rarely, because ORD often cannot meet immediate short-term needs for science. OSWER participates in ORD's planning efforts, but staff felt that ORD often does not fill science gaps important to OSWER and called for more dialogue between OSWER staff and ORD lab directors and ORD's national program manager. Sometimes ORD's research initiatives can be modified in minor ways to increase their usefulness for OSWER programs. One interviewee noted the limited funding available for ORD's "land budget" to fund research. An area of immediate importance is investment in science underlying ecological benefits. Staff welcomed ORD's investment in research on ecological services, even if such research is focused on long-term outputs. ORD also provides input on OSWER regulations through EPA's work group process. There is, however, no formal measure of how much ORCR decisions are affected by ORD research or measures of how much ORD research affects decision making.

Another topic was lessons learned from evaluations of past use of science. One staff member noted that the pesticide program has compared the cost of cancelling pesticides against EPA's assessment of cancellation costs. EPA has routinely found that it overestimated impacts and has learned from that evaluation. ORCR conducts evaluations more informally. He predicted that lifecycle analysis will play an increasingly large role in EPA analyses and called for "fuller input /output cost/benefit life-cycle analysis" to be placed on EPA research agenda.

Interviewees then discussed how they "drive science forward" within their group at EPA. Staff noted that there is an Agency-wide economic forum, which allows economists to share information, learn about best practices and work together to address policy needs and gaps. The Economics and Risk Analysis Staff also sometimes uses a contract mechanism to fund white papers on important science policy issue. The OSWER science panel could then hold a symposium focused on that issue. OSWER used such an approach to address nano-technology lifecycle analysis issues. In addition, staff interact with international groups of solid-waste officials through the Organization of Economic Cooperation and Development and with state solid-waste officials and risk assessors. Economists have recently communicated more actively with their counterparts in the regulated communities.

The discussion turned to uncertainty analysis and the characterization and communication of uncertainty. Interviewees responded that they conduct uncertainty analyses and present information in ranges, rather than point estimates. They conduct probabilistic risk assessments, sometimes with very sophisticated models that use realistic information for key parameters (such as rainfall and hydrogeologic conditions) to generate "real-world" assessments. Sometimes, however, it is difficult to communicate uncertainty information for regulatory decisions. Scientists are "stymied" when they try to follow up on SAB and NRC recommendations regarding uncertainty. In one case, a member of the Economics and Risk Analysis Staff developed an analysis based on a "little PC-based model, with a nice uncertainty description." When she tried to communicate the uncertainty concisely in a Federal Register notice, the "Branch Chief decided that the language made it look like EPA didn't have a firm grasp of the

number and chopped it out." Scientists get "similar feedback from the lawyers," who say "you can't set us up for losing a lawsuit in the future." Even when results of an uncertainty analysis are published, the media often ignores the uncertainty. The media ignores the range and focuses on the point estimate--the upper end and median. It is very difficult to communicate accurate risk information in understandable ways. Interviewees noted that EPA managers differ in their interest in risk issues. Some are not willing to focus on the issues; other managers "really engage," and some engage too much and get lost in the details.

The interview then turned to the challenge of maintaining the "right discipline mix" among scientists as EPA faces a wave of retirements. This topic is a focus of management concern. Interviewees noted that sharing and team work helps the Economics and Risk Analysis Staff be effective. The Economics and Risk Analysis Staff has some of the core staff needed (hydrogeologist, engineers, soil scientists, economists, and risk assessors). They fill other critical needs (e.g., for a toxicology review) with contract support."

Interview with ORCR Director

Dr. Matthew Hale

Dr. Hale began the discussion by describing ORCR as both a "science-based institution and a legal-based institution," especially on the regulatory side. Science plays an important role but his office doesn't address pure science issues. Although the Resource Conservation and Recovery Act is not a cost-benefit statute, the office "looks at risk" for significant regulations, because EPA's mission is to protect human health and the environment, and the office looks at cost to help choose among options. Cost-benefit analysis is often a surrogate for choosing among smart, practical options.

Timing is a "perpetual challenge" for science integration. At the early stage of decision making, Dr. Hale seeks risk and economic analyses to help frame a problem and identify basic options. ORCR tries to have "enough information up front to make sensible decisions" but tries not to let the analysis become the focus of the activity. The priorities for his office are "laid out by statute" and have largely not been "of our choosing." With limited resources, he must consider how to get funds to address new emerging areas. In this context, ORCR uses "hard risk assessment science to deal with what's on our plate, as opposed to identifying emerging new chemicals." He is looking at the science underlying materials management and materials-flow analysis as areas where ORCR is most forward looking. For that science, he turns to the World Resources Institute and the Sustainability Consortium's sustainability initiative, a joint effort among 10 leading universities, European Scientists, with ORD input. He is looking for opportunities to encourage sustainable products and activities as a program direction.

SAB members asked Dr. Hale to discuss how he deals with uncertainties. He responded that research on most issues identifies anomalies, not more surety. In his view, when a decision needs to be made, "you have to stop and make a call." If EPA needs a risk assessment number for a listing decision and EPA doesn't have one, "we'll pick a number that California used." He noted the value of combining risk assessors and economists in ORCR's Economics and Risk Analysis Staff. For his office, he "likes to think science is part of everyone's skill sets." He expects staff to know the issues and know the related science and scientific uncertainties.

In response to an SAB member's question about processes to help improve the use of science over time, Dr. Hale responded that feedback comes in three ways. The public provides feedback. Peer review is a good way to get feedback. And if something hasn't worked internally, he hears and listens to complaints. To foster science integration, the office encourages team approaches and expects scientists to build and maintain networks related to their work.

The discussion concluded with a brief discussion of communicating science and risk. Dr. Hale noted that often the key issue is whether EPA has "the legal minimum to sustain challenge." Whenever EPA communicates, it is very important to write or speak clearly in a "straightforward manner" and not get trapped in jargon. There is a need for good communications people at EPA who can help translate information for different audiences. There's a need for better writers, more communications support, and training for EPA staff, who, very often, think they don't need training.