

**EPA Region 6 Science Integration for Decision Making Fact-Finding Interviews
December 9, 2009
1445 Ross Avenue, Dallas, Texas, 75202**

Three members of the SAB Committee on Science Integration for Decision Making conducted three interviews in EPA Region 6: Dr. Terry Daniel in person, with Drs. Deborah Cory-Slechta and Catherine Kling participating by phone. For each interview, Dr. Vanessa Vu, Director of the SAB Staff Office, provided a brief introduction to the purpose of the interview and the Designated Federal Officer, Dr. Angela Nugent, 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. Vu noted in each interview that the purpose of the interview was to help SAB Committee members learn about Region 6'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. Vu thanked participants for taking time for the interviews and thanked Dr. Michael Morton for serving as liaison with the SAB Staff Office in planning the interviews.

Participants in Discussion with Senior Managers

Ms. Lynda Carroll, Director, Management Division
Mr. Carl Edlund, Director, Multimedia Planning and Permitting Division
Mr. Sam Coleman, Director, Superfund Division
Mr. Myron Knudson, Senior Policy Advisor to the Regional Administrator
Mr. Rick McMillin, Chief, Laboratory Analysis Section, Houston Laboratory
Mr. William Luthans, Deputy Director, Multimedia Division
Mr. Steven Gilrein, Enforcement Division
Mr. Miguel Flores, Director, Water Quality Protection Division
Ms. Deborah Ponder, Deputy Director, Environmental Justice/Tribal Division
Mr. Randy Gee, Associate Director, Tribal Affairs
Mr. Benjamin Harrison, Deputy Regional Counsel

The discussion began with a request for the SAB to define "science." Dr. Vanessa Vu responded that for this study, the SAB defined science as the use of scientific knowledge and data to answer environmental protection questions. Science can include chemistry, biology, toxicology, engineering, social, or economic sciences.

Participants were asked to comment on any of the major areas of enquiry in the SAB committee's study plan. A participant began the conversation by noting the massive deterioration of ORD over the past 10 years as a result of a budget cut of \$100 million, along with line items not part of ORD's overall program. The only area for growth has involved homeland security. ORD's reduced budget has affected the regions. ORD has eliminated the Environmental Monitoring & Assessment Program and programs that benefit the regions in both the short and long term. He asked SAB to communicate that ORD's budget problems delay assessments needed for regulations and EPA's ability to address future problems presented by nanotechnology, endocrine disruptors, and pharmaceuticals.

Another participant noted that regions no longer benefited from funding for regional geographic initiatives, which supported innovative environmental research important to the regions. Each region has its own set of priorities. Because of its geography and history, Region 6 has a special interest in research related to hazardous waste combustors, indoor environments affected by vapor intrusion, spectral imaging for air emissions, passive monitoring techniques as EPA expands nonattainment areas, new federal reference methods, and methodologies for measuring asbestos contamination. Because tremendous energy networks exist in the Region, there is a need for research on systematic conservation of energy that will positively affect air quality, water quality, and climate change.

A manager commented on the needs of tribes who participate in the national tribal science council. Tribes have identified a need for efficient, inexpensive tools such as superconducting radio-frequency technology and ozone testing. Tribes need reliable tools that can give them confidence that they are doing good science.

Another manager observed that additional funding for science is not likely. Although resources are a major issue, another problem related to science integration is the different time frames for the scientific strategic process, which can have an 18-year horizon and the political strategic process, for which long term planning can be as short as 18 months. Science cannot catch up with policy. An example is global warming, which has suffered for lack of earlier investment.

The Superfund program requires immediate solutions. ORD, however, provides research on remediation and technology not related to specific field implementation. One manager described how he tried to fill a research gap by investing Region 6 funds to address a specific problem only to find that ORD has duplicated the research. The regional Superfund program has not found a way to mesh research planning at the regional level with ORD.

Another regional science need relates to public focus on bad or misleading science. One example involved sampling data generated by universities during Hurricane Katrina. University scientists collected samples that were not statistically valid and posted this information on the web as monitoring data. EPA still receives questions about these data and has difficulties communicating the need for approved protocols and good science in providing environmental information. EPA encounters problems communicating the science and engineering involved in environmental protection.

The region has a science policy advisor and an ORD science liaison to help integrate science across the programs. Regional managers have also worked in ORD to learn how ORD deals with regional science and technology needs needs.

Another manager noted that ORD does a better job of meeting Superfund needs than those of other regional programs. In his view, a greater concern was long-term research needed to bridge the gap between policy and science. He called for investment in full lifecycle analysis of science and decision making. Without a full lifecycle analysis, short-term solutions become long-term problems. Oxygenates in fuels reduce air quality. MTBE ends up in groundwater.

Increased production of ethanol may contribute to climate change. He applauded the requirement for lifecycle analysis in the Energy Independence and Security Act.

The SAB committee member asked whether there were mechanisms to "feed back" information about science applications in the field to ORD and other regions. Integration requires exchange of information in multiple directions.

A manager responded that regions could benefit from increased research on communication of science. EPA and the public often look at the same issues and reach different conclusions. EPA needs to learn how to communicate data quality objectives both to scientists and non-scientists.

A manager responsible for enforcement spoke of the need to use science to target enforcement actions. There is a need for technologies for remote sensing for all media (i.e., air, water, soil contamination) and multi-media monitoring that provides genetic speciation linking contaminants to different sources (e.g., humans, cows, avian sources). The region must constantly prioritize its activities and focus on communities co-located with industrial and agricultural complexes. He also called for affordable ways to treat pollutants in small communities. Reverse osmosis for arsenic is one example of a technology that is not affordable by communities.

To one manager, science issues in the region could be traced to four factors: lack of knowledge; lack of time; lack of communication; and lack of integration. Regional managers often don't know what ORD is doing and what universities are doing. Much too often, regional managers only learn about innovations important to the region's mission by accident. Lack of communication is a big problem. ORD should talk about the relevance of its research findings at regional offices. Lack of time plays a role. There are so many programmatic issues, that regional staff often don't have the time to understand the science involved. The ORD regional science liaison plays an important role, but there are so many different labs and ORD activities, ORD might usefully place additional scientists in regional offices. Finally, lack of integration across media is a continuing problem. EPA statutes and the Region 6 organization encourage a single-media perspective. EPA could invest more in cumulative risk and the integration of social and economic science with "regular science." As American society becomes increasingly urbanized, different ecosystem problems will emerge because of increase population density. New technologies, such as cell phones and computers also will change how people experience their environment. EPA must provide more affordable treatment technologies for tribes and small communities without delivering different levels of protection for "haves" and "have nots."

A manager responsible for the Houston laboratory provided some remarks related to science integration. His organization doesn't "get involved in policy setting," but analytical results from his lab contribute to decisions. He called for more science designed to meet new challenges presented by chemical warfare and pharmaceuticals. He noted that the laboratory's portfolio has expanded to add new activities and responsibilities (e.g., chemical warfare testing) without adding staff or changing their expertise in major ways. He suggested that ORD organize meetings and workshops, whenever it released a new technique or method.

Another manager followed this comment by telling a story about his learning by chance about research at ORD's Ada, OK Laboratory on geological sequestration of carbon. Region 6 is very concerned with growing carbon dioxide emissions. It is also the region with the greatest capacity for geological sequestration. Because of that one chance conversation, Region 6 is working with the Ada, OK laboratory and local universities to build expertise about what happens to carbon dioxide after it is pumped into the ground. The region is building expertise to evaluate regulations for new wells, conduct site characterization, and approve permits for new classes of wells. The manager expressed a wish that communications between ORD and the Region 6 were more systematic and collaborations routinely sought and developed.

Meeting participants agreed about the need for more information sharing about science activities and research not only within EPA but also with the private sector and other federal agencies. ORD should also invest more resources in synthesis of existing science, a project often not valued by ORD scientists. One interviewee also noted a recent review of EPA's science inventory and the need for transforming it into an interactive tool that regions and programs could use. Regional science liaisons could periodically review activities and communicate about ORD research to the regions.

The meeting ended with a short discussion of social and behavioral science. Managers called for reinvestment in research related to risk communication and the value of social and behavioral sciences to communicate the science supporting EPA's decisions.

Meeting with the Regional Administrator (Dr. Alfredo Armendariz) and Deputy Regional Administrator (Mr. Larry Starfield)

The Regional Administrator provided comments on science integration, especially the relationship of science and policy. He noted that he was in his second week at EPA and drew on his past experience in academia and as a technical advisory to the environmental community in his comments for the SAB.

One of his major concerns is how to get the public sufficiently informed to provide meaningful comment and meaningful input into the decision making process. Often, for a permit, EPA might hear comments on asthma or odors with very little relationship to the waste water treatment modification being considered. People have grievances they need to transmit many times before they can provide comments useful to EPA.

In general, EPA generates good data, but it is hard for the public and even outside scientists to view the data in an integrated way. To understand overall air exposures and consider air toxics exposure, criteria pollutants exposure, inspection data showing the last date of inspection, and current plans for facility expansion, one would have to search for data in five different locations. Some data would be held by EPA; others by the states; some would be web accessible; others would be provided in pdf form. Sometimes it takes a long time for members of the public to get the information they seek. A reasonable goal would be to get all available data for a given facility in an afternoon. People would provide better comments and EPA would make better decisions. He advocated that the SAB recommend integration of data within EPA and with the states.

He noted that EPA does take public participation seriously and provides ample opportunities for comment. A disconnect happens because the public sometimes finds it difficult to frame comments in meaningful ways relevant to regulatory activities. He recommended that EPA seek opportunities to interpret comments in ways relevant to rulemaking. He agreed that it might be useful for EPA to provide guidance, templates, or examples showing how public comment could be useful for EPA.

The Deputy Regional Administrator suggested that it would be helpful for the SAB to provide advice on how the Agency can communicate technical information to people more effectively so that the public can provide more meaningful comment. It would be helpful to understand ways to communicate uncertainties, complex information, and concepts like cumulative risk more effectively.

The Regional Administrator noted that environmental groups can be useful in bridging the gap between EPA and the public. The environmental community has experience interpreting technical data and communicating that information to the public.

The Regional Administrator reflected that the public is interested in a more holistic picture of cumulative risk than EPA provides. Where Region 6 addresses cumulative risk, it tends to present media-specific information, for example, air toxic analysis that looks at multiple chemicals. The public, however, is interested in understanding the overall risks they face--not only through the air, but also through exposures to drinking water, land contaminants, food, and smoking. He remembered members of the public asking "it safe for me to live in this town." Questions like that are "almost impossible to answer" but need to be addressed.

Risk-based targeting is an important tool for regions because it can help set priorities, given limited resources. A systematic method for cumulative risk targeting would be very useful. The Deputy Regional Administrator referenced a helpful report by the National Environmental Justice Advisory Committee, which provided guidance for community-based stressors evaluation so that communities could identify targets for self regulation.

The Regional Administrator called for research to lower the cost of monitoring complex air pollutants and personal exposures to a wide variety of chemicals near Superfund sites. He noted the need for improved air toxic monitoring. The city of Fort Worth has only one monitor. Regions with disproportional numbers of industrial facilities have a natural need for additional monitors. He also noted a significant need to understand impacts of pollutants at increasingly lower levels.

In response to a question about high priority needs that ORD could fill, the Regional Administrator responded that it would be useful to have an ability to bring a national expert team into a community for a short period of time, following the model of the Superfund Emergency Response Team. An expert team could be detailed to stay in a community for a month to investigate a problem.

He acknowledged past advice provided by the SAB and National Research Council, but challenged those organizations to provide extracts of recommendations to provide to staff working on those issues so recommendations could be more effectively implemented.

Participants in Discussion with Scientific and Technical Staff:

Mr. Erik Snyder, Regional Air Quality Modeler, Multimedia Planning and Permitting Division

Ms. Adele Cardenas, Senior Policy Advisor to the Water Quality Protection Division Director

Ms. Lisa Price, Environmental Scientist, Multimedia Planning and Permitting Division

Mr. Richard Ehrhart, Environmental Scientist, Multimedia Planning and Permitting Division

Mr. Vincent Malott, Remedial Project Manager, Superfund Division

Dr. Jon Rauscher, Toxicologist, Superfund Division

Dr. Jane Watson, Chief, Ecosystems Protection Branch

Mr. Michael Overbay, Regional Ground Water Coordinator, Water Quality Protection Division

Mr. Scott Ellinger, Environmental Scientist, Multimedia Planning and Permitting Division

Mr. Myron Knudson, Senior Policy Advisor to the Regional Administrator

Ms. Tina Hendon, Environmental Scientist, Water Quality Management Division

Ms. Beverly Ethridge, Environmental Scientist, Water Quality Management Division

Mr. Jeffrey Yurk , Toxicologist, Compliance Assistance and Enforcement Division

Dr. Michael Morton, Region 6 Science Liaison to ORD

SAB members asked regional scientists to describe how their work supported Agency decisions and their perspectives on science integration. Scientists responded in turn. A scientist in the Ecosystem Protection Branch told how the region principally drew on its own expertise and those of contractors, rather than ORD or the academic community, because of time constraints. Her branch developed the science needed for Records of Decisions, based on ORD models. She noted that her program does not have a plan for research needs that involves ORD.

A Superfund Risk Assessor described how he relied on ORD's IRIS numbers and rarely developed independent hazard information. To develop exposure assessments, he relied on ORD's Exposure Factors Handbook, which is "invaluable in providing information that can be tailored to individual sites." The program usually relies on defaults, but when a decision is significantly costly or controversial, the program develops site-specific information. One example is fish consumption in Lavaca Bay. He wondered how new research areas such as genomics would be used for risk assessment, since it did not seem to have outcomes useable for site-specific risk assessment. He noted that he does collaborate with enforcement personnel to look at the impacts of multi-media emissions of multiple facilities in a particular airshed or watershed for the purpose of targeting enforcement actions.

A scientist working with the region's enforcement program observed that ORD documents were not designed for easy use by regional scientists, who need criteria related to site-specific implementation. He also called for ORD to focus on climate change science at temporal

and spatial scales useful for the region. He often finds it difficult to identify ORD experts on particular issues. One exception is ORD's new ecological services program, where the National Program Director serves as the "go-to" person for regional questions related to ecological research.

Scientists in the region have developed a cumulative air risk model, which has been peer reviewed and is included in the Council on Regulatory Environmental Model's inventory. It is fairly widely used for sampling and inspections. The regional air program generally generates its own science, because outputs from ORD sometimes do not help the region implement air policy. One example of such an ORD product is the National Air Toxic Assessment, which contains outdated data from 2002 and does not include newer emission data or reference enforcement actions. Another example is the exposure model HAPEM, which is complex and difficult to use and not validated by monitoring information.

A scientist in the regional RCRA program spoke of difficulties participating in the ORD multi-year planning process. He voiced frustration when multiple regions' priorities were simply listed in an appendix of the multi-year plan. ORD seems to respond quickly only when an issue is particularly controversial or gets political attention. Another scientist in the RCRA program agreed that ORD does not provide much support for her efforts and that she seeks science support from local institutions of higher learning.

Several regional scientists noted that ORD projects are long-term, while regional needs shift in response to on-the-ground issues. They called for part of ORD to be available to act as consultants or resource experts to counsel and assist the regions. The Regional Science Liaison to ORD suggested that the SAB committee review the "45-day study" developed by EPA regions in 2004 in response to a request from Dr. Paul Gilman, former Assistant Administrator for ORD and EPA Science Advisor. That 2004 study discusses many of the issues raised by Region 6 staff and provides recommendations.

A RCRA scientist voiced concern that politics sometimes precluded attention to the science related to an issue. One arena is industrial materials recycling, where states have beneficial use determinations and science concerns about protectiveness have sometimes been ignored. Past decisions not to follow through on science concerns and instead defer to states, have resulted in problems like the Kingston Coal Ash spill that have "put the Administrator in the hot seat." Another scientist voiced concern that too much decision making is delegated to states and that states sometimes do not make policies adequately informed by science. He noted that Oklahoma allowed one facility to detonate a million pounds of explosives without a groundwater permit. Region 6 is now reexamining data requirements involved in such permits.

A scientist working in the RCRA program spoke about the resources available to him to investigate soil, ground water, and develop different remedies. "Cost and time are always considerations." He also noted that Region 6 has a strong Brownfield program, which works with states to document benefit use and limitations. Those added determinations require significant time for community input. EPA actively promotes Brownfields programs for Superfund sites because those operate as part of a federal program. RCRA is delegated to the states; Region 6 encourages states to promote Brownfields planning and use.

A second Superfund scientist agreed that the Superfund program benefits from strong support from ORD and the Office of Solid Waste and Emergency Response (OSWER). There is an ORD Superfund liaison in each region that facilitates communications about new sciences and new remediation technology and provides feedback from the regions to national program officers. There are groundwater, engineering and federal facility forums, and ORD participates in monthly Superfund calls and bi-yearly meetings. He recommended webinars provided by OSWER through the Clu-In program. This mechanism centralizes access to training and information.

The Superfund program also manages an effective peer review process, where experts in vapor intrusion or groundwater, for example, develop issue papers and get feedback from regional offices. The process sometimes takes a long time, but ultimately develops the guidance regions need. One current issue involves responsibility for photographic analysis and maintenance of historical photos, an issue important to regions when tracking historical waste disposal activities at Superfund and RCRA sites. The Superfund program benefits from funding appropriated specifically for Superfund needs.

A scientist working in the Region 6 Multimedia Planning and Permitting Division described his fortunate experiences working with ORD, which provided references, consultation, and peer review for his applied research. He distinguished regional science activities from science supporting national policy and rulemaking. There is an intensive effort in national program offices to follow administrative procedure, work in a formal process, and bring in science from stakeholders and trade associations. In the region, each scientist develops "his own framework" based on "science fundamentals." This framework may involve consultation with internal regional experts, contractors, managers, outside scientists, and states. Individuals learn for themselves and learn that external political decisions greatly affect regional scientific analysis.

Another scientist described a major project involving development of an alternative asbestos control method that challenges an existing National Emission Standards for Hazardous Air Pollutants asbestos "Chart Rule," which requires clean-up if materials contain more than one percent asbestos. As a result, many abandoned buildings are not being renovated for potential use because of potential costs and liability concerns over asbestos-containing materials. Region 6 initiated research on alternative clean-up approaches and has worked with ORD's National Risk Management Research Laboratory. EPA invested \$3 million in research and the resulting reports are being peer reviewed. The regional scientist noted delays in releasing the research because it challenges EPA's current clean up regulations,

A scientist in the air program described the importance of air quality modeling to air pollution control. Modeling contributes to determination of the ozone state implementation plans, regional haze decisions, and permits. Region 6 benefits from tremendous investment by the State of Texas in air pollution science. A percentage of car registration fees in Texas goes to generally to air research and specifically to model development. Local universities host scientists conducting research with that funding. He works with two air quality models models, CMAQ, developed by EPA, and CAM_x, a proprietary model, which has components with

updated science addressing particulate matter. He believes that emissions from coal-fired power plants can be effectively studied with CAM_x and commented that ORD would benefit from interacting with modelers in Texas to expand their air quality modeling knowledge and capabilities.

Scientists at the regional laboratories spoke of the need for more efficient and less labor intensive protocols to support regional customers needing data analysis for site assessment and clean ups. They called for more communication among regional laboratories, between ORD and regional laboratories, and between regional laboratories and headquarters offices. There is a lack of resources and personnel to develop more efficient methods for current pollutants and methods for analyzing new pollutants.