

**EPA Office of Environmental Information (OEI) Toxic Release Inventory (TRI) Program  
Science Integration for Decision Making Fact-Finding Interviews  
November 24, 2009  
Washington, DC**

Five members of the SAB Committee on Science Integration for Decision Making interviewed the Director of OEI's Office of Information Analysis and Access and Managers responsible for implementing the TRI Program. Drs. James Bus and James Johnson conducted the interview in person with participation by phone from Drs. Catherine Kling, Jill Lipoti, and Thomas Theis. 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 the TRI Program'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 TRI Managers**

**Participants:**

Mr. Rick Martin, Acting Director, Office of Information Analysis and Access  
Ms. Michele Anders, Acting Deputy Office Director, Office of Information Analysis and Access  
Mr. Michael Petruska, Director, Toxic Release Inventory Program Division  
Ms. Nancy Wentworth, Director, Environmental Analysis Division and Acting Associate Office Director, Office of Information Analysis and Access

SAB members began the interview by asking managers about their role in three parts of the TRI program where EPA makes decisions based on science input (where decisions involve adding a chemical, setting a threshold level, or delisting a chemical). They asked interviewees to describe their role and how they use science. The first topic discussed was chemical listing. Staff in the Environmental Analysis Division, following the mandate in Emergency Planning & Community Right-to-Know Act (EPCRA), develop a hazard assessment that addresses acute and chronic hazards that relate to both "fence-line exposure" and exposures to the general population. They emphasized that the TRI program is mandated to assess hazard, not risk. The TRI program has historically faced a challenge. The public often sees hazard listing and becomes concerned. EPA tries to communicate that the "number's significance depends on the exposure pathway," but that message is difficult to communicate.

EPA must work within the legal framework provided for the TRI program and use science to achieve practical results. The TRI chemical list includes approximately 600 chemicals. Most are identified in the original statute, and the listing of some chemicals "had no scientific rigor compared to today's requirements for listing." Although some listed chemicals have never been reported or are produced in low quantities, EPA cannot take the chemicals off

the list without performing a full hazard assessment and it may not be worth the trouble to take on such work.

The TRI program does look to add chemicals; the statute provides criteria for listing (e.g., hazard, production volume, volume in commerce). Sometimes the program takes the initiative; at other times, it responds to suggestions from other EPA programs that need information or to public petitions. Decisions to list chemicals must satisfy the listing criteria and also meet information collection request requirements under the Paperwork Reduction Act. When EPA decides to list a chemical, it prepares a full human health and ecological hazard assessment, which is peer reviewed, and then proceeds with a full notice and comment process. For persistent bioaccumulative toxicants (PBTs), where there is a concern at a lower level, there is a lower reporting threshold as “chemicals of special concern.” Such chemicals receive an additional level of documentation and scrutiny. Managers and TRI science staff are aware of controversy over application of PBT criteria to metals and inorganic metal compounds, and the designation of metals and inorganic metal compounds as PBTs.

Staff work hard to stay current with the literature and participate in EPA’s Risk Assessment Forum. They monitor the activities of the National Toxicology Program, participate in Scientific Advisory Panel meetings, and keep aware of national and international debates on those scientific issues. Peer review plays a major role in ensuring quality science. Managers also mentioned that listed chemicals must be reported by listed industry sectors. They discussed recent initiatives to list the mining and electrical utility sectors and noted that currently the agricultural sector is not listed, but that if it were, it would be possible for Concentrated Animal Feeding Operations (CAFOs) to have reporting requirements.

SAB members asked about the protocol for hazard assessments. Managers responded that scientists take a weight of evidence approach and rely on peer-reviewed information. One manager noted possible efficiencies in using more National Toxicology Program assessments. In response to a question about possible use of ToxCast information for chemicals that haven't been tested, a manager responded that such information would not be used by the TRI program until related toxicity issues are resolved in the scientific community.

Managers noted that the TRI Program does not have an independent monitoring requirement. Much of the reported data is estimated, not measured, in the field. This poses interpretation problems for data users. The TRI data elements contain metadata which indicate how the data were derived (e.g., monitoring, engineering estimates, etc.) EPA provides data users with a document describing "factors to consider" in using TRI data. EPA also provides data providers (reporting facilities) with instructions on filling out the TRI form, including providing appropriate metrics for release estimates and choosing appropriate descriptions of the basis of estimate (e.g., whether reported quantities are measured or monitored). Nevertheless, sometimes the information provided, like a single number for an entire chemical facility for an entire year, could be a mix of modeled and monitored data. The statute requires submitters to provide the best information they have. EPCRA specifically prohibits EPA from requiring monitoring or requiring the taking of new measurements to improve reporting. However, in some cases, another EPA program institutes a new monitoring requirement (e.g., air monitoring

for mercury was recently required for some sources under the Clean Air Act), and when that happens, many more facilities use measured data in TRI.

EPA currently provides a level of quality control on the reported data to identify anomalies or gross mistakes in reporting. In some cases, EPA contacts facility operators to verify data they have submitted. If data are incorrect, EPA allows facilities to revise their submissions to provide the correct data. In egregious cases, submission of poor quality data may also be considered a violation of EPCRA reporting requirements.

To communicate the TRI results, EPA both provides written narrative documents, such as the document Key Findings ([http://www.epa.gov/tri/tridata/tri08/national\\_analysis/pdr/TRI\\_key\\_findings\\_2008.pdf](http://www.epa.gov/tri/tridata/tri08/national_analysis/pdr/TRI_key_findings_2008.pdf)), and the Agency also tries to provide tools at different levels of sophistication for different audiences (<http://www.epa.gov/tri/tridata/index.htm>). Envirofacts is very detailed. TRI.Net provides very sophisticated analysis and notes. TRI Explorer is a more “general public” oriented tool. These tools allow people with varying information needs and computer skills to analyze/evaluate chemicals and use TRI data for their own decision making.

There is much interest in TRI data, especially in underserved, environmental justice communities. The Office of Pollution Prevention and Toxics uses TRI data to evaluate baseline risk.

SAB members asked whether EPA uses social science to determine whether people are “getting what they need to know.” A manager responds that EPA does “usability testing” and beta testing for specific audiences. The Office of Environmental Information (OEI) has a network of user groups developed as part of its work on the *Report on the Environment* and OEI’s national dialogue on environmental information, conducted over the past two years. These groups identified the kinds of information desired and modes for providing information. The TRI program makes use of this information. OEI also has a cooperative agreement with the Environmental Council of the States (ECOS). Under the ECOS agreement, EPA and ECOS sponsor both a website ([www.chemicalright2know.org](http://www.chemicalright2know.org)) and a national conference to bring together stakeholders and data users to discuss TRI and related topics of interest.

Managers also noted that the TRI program is trying to engage the public with web 2.0 tools. The ECOS cooperative agreement as a web 2.0 tool platform for dialogue, which provided input for the mining sector regulations. The mechanism provides direct interaction on a broader scale. The TRI program is also exploring possible use of the National Environmental Justice Advisory Committee and National Advisory Committee for Environmental Policy and Technology. One manager noted that “with so many different audiences, delivery mechanisms need to be quite flexible, which poses a big challenge and requires vision.” Historically, TRI data have been used by a limited number of non-governmental organizations (primarily Right-to-Know Networks). Information technology and Data.gov may be changing that profile. More individuals are downloading raw TRI data, but the driving rationale for that change is not clear and needs to be explored.

A manager noted that the Administrator currently has directed the TRI program to consider enhancements for involving communities in the TRI program, including enhanced tools for communication. The program is “just at the brink of taking new look.” The effort will probably involve regions in new efforts to engage with communities and facilities. EPA has also recently created a TRI steering committee to review possible regulatory changes and seek enhanced ways to engage with communities. The Director of OEI’s Office of Information Analysis and Access co-chairs the steering committee with the Region 9 Communities and Ecosystems Division Director.

One recent initiative, responding to public feedback, has involved providing TRI data more quickly. In 2009, the TRI reporting deadline was June 30 for releases occurring in 2008. 80% of TRI data were available in August and 100% in September. Another public request is to provide more context and risk information; EPA is considering how that can be done.

The managers then discussed issues related to their scientific and technical work force. One manager noted that staff have individual development plans and attend professional meetings. TRI scientists participate in Agency work groups. She maintains a “sturdy” travel and training budget so people can stay certified. Managers noted that staff have a strong desire to be competent leaders in their field and are passionate about science in their program. Managers noted that there hasn’t been a need to retrain staff when new sectors have been added; the skill set for the TRI scientists has not changed. If there are questions related to new sectors, contractors address those issues.

Another manager noted that there is an annual TRI conference with participation from states, tribes and environmental groups. The conference has in the past noted emerging issues (e.g., air emissions, mercury from mines) that have lead to TRI program changes

Managers noted that politics and policy, not science, sometimes drive the TRI program. At times, the political leadership is not interested in expanding the program. At other times, there is an “appetite for pro-active program management.” Currently, staff are looking at “pent-up listing” possibilities for new chemicals.

## **Interview with TRI Staff**

### **Participants:**

Dr. Daniel Bushman, TRI Petitions Coordinator and Chemical List Manager, Environmental Analysis Division

Dr Stephen DeVito, Chairperson of EPA’s Office of Information Access and Analysis’ TRI Data Analysis Team

Dr. Nicole Paquette, Chief, Analytical Support Branch, Environmental Analysis Division

In the first part of the discussion, TRI staff described the intent of EPCRA section 313, its statutory provisions, and the purpose of the TRI. The staff stated noted that EPA’s TRI program is by its very nature a nationally-based multi-environmental media program. Hence, hazard assessments performed by the TRI program must, by necessity, be broad to encompass all environmental media and all environmental conditions in order to properly characterize the hazards of chemicals following their release into the environment.

The scientists described their role in supporting Agency decision within the framework provided by EPCRA. Staff conduct chemical assessments of environmental fate, human health, and ecological hazards to support proposals to list chemicals. They generally rely on IRIS assessments but in the past have conducted a "whole assessment" independently. Their work is peer reviewed. They noted that listing decisions have not been active over the last eight years but are "starting up again."

SAB members asked how scientists manage to restrict their analysis to hazard, without broadening the analysis to discuss risk. Staff acknowledged that they "walk a fine line" and try to focus on the "inherent toxicity of chemical we assess." Such an approach is consistent with IRIS assessments, but analysis of acute effects, by definition, involves assumptions about exposure. One staff member noted that the TRI program has delisted chemicals where it has determined these chemicals do not cause chronic human health or ecological effects, and "beyond the fence line" concentrations would not result in exposures that would cause acute or human or ecological effects, or for which available data do not support continued inclusion of a chemical on the TRI list of toxic chemicals.

The TRI program is not required to conduct risk assessments when deciding whether a chemical should be listed onto or delisted from the TRI list of toxic chemicals. However, in addition to characterizing a chemical's toxicity and environmental fate, as a practice the TRI program generally considers whether exposure pathways exist to organisms (i.e., humans) sensitive to the toxic properties of a given chemical and its environmental metabolites. An example of such was the delisting of barium sulfate, a metal compound. Barium and its compounds (including barium sulfate) were included on the original TRI list of toxic chemicals, which was established by Congress and given to EPA. The TRI program was petitioned to delist barium sulfate from the TRI list of toxic chemicals.

The staff emphasized that a hazard assessment of a metal conducted by the TRI program involves the identification and integrated assessment of data and information pertaining to: the chemistry and fate of the metal in all media and under the range of different environmental conditions that exist throughout the United States; its environmental transformation products; the bioavailability of the metal and its environmental transformation products in humans or other organisms; the environmental accessibility of the metal ion from the form in which the metal was released to the environment, or from environmental abiotic or biotic transformation processes; and the known or anticipated toxic effects that the metal or its environmental transformation products may have on human health or the environment.

In its subsequent hazard assessment of barium ion and barium sulfate, the TRI program concluded that barium ion is toxic to humans and the environment and can be liberated from barium sulfate in the environment. Nonetheless, the TRI program concluded that barium sulfate should be delisted from the TRI list of toxic chemicals. The basis of the TRI program's decision to delist barium sulfate was that: liberation of barium ion from barium sulfate occurs only under certain anaerobic conditions found in stagnant water bodies that have low sulfate concentration and that are cut-off from surface and ground waters; and if barium ion formed as such migrates into ground or surface waters it will react essentially instantly with naturally occurring sulfate to form insoluble and non-toxic barium sulfate; and the environmental life-cycle of barium ion does

not give rise to human or environmental concerns. In general, however, the statute requires that, for delisting, a chemical must have “no known toxicity.” If there's a doubt, EPA would characterize the doubt and keep the chemical on the list.

The TRI scientists noted that in general, the TRI program relies on peer-reviewed information generated by EPA. Where that information is not available, the TRI program seeks other information with high integrity. The TRI program's 2004 chemical assessment guidelines provide internal guidance for conducting assessments. EPA's TRI assessments are provided for public comment in the Federal Register.

An SAB member asked whether and how TRI staff might use ToxCast information or high-throughput analyses for TRI assessments. Interviewees responded that most of those data are “virtual” and the result of modeling. The TRI program relies on “concrete” toxicity data. They have made some limited use of information based on structure-activity relationships, but wouldn't feel comfortable using more assessments based on modeling, unless the data were peer-reviewed and validated. They discussed perfluorooctanoic acid (PFOA) and PFOS as two chemicals that did not have sufficient toxicity information of the kind needed for TRI listing.

Scientists noted that the TRI program itself has no mechanism to fill data gaps in a hazard assessment, which must be conducted within a short time frame. Staff noted that the TRI program imposes reporting requirements only. Since it does not restrict use of a chemical, the program makes calculated judgments about how much effort to put into the supporting data gathering.

Staff then discussed ways in which they participate in dialogue with scientists in other organizations to keep abreast of developments and ensure consistency in weighing data. Scientists responded that the TRI program develops work groups for regulatory actions; usually scientists from OAR and ORD participate. Responding to petitions requires interaction with petitioners. The TRI program tries to follow EPA guidelines (e.g., the neurotoxicity and cancer guidelines) to guide decisions even on chemicals where EPA does not have a fully developed risk assessment. The scientists noted that for emerging chemicals, like nano-technology, the TRI program is waiting for the toxicology database to grow. Science is needed to establish the hazards of nano-chemicals and to identify meaningful thresholds for TRI reporting.

Interviewees next focused their discussion on drivers and impediments to science integration. Scientists initially responded that their focus was narrow, based on EPCRA's mandate for hazard assessment. The SAB interviewers asked about efforts to use social sciences to understand how people use TRI information and how the program can help them make better use of it. One scientist noted that 30 EPA programs use TRI on a semi-regular basis and that there are a wide range of industry, environmental groups, citizen groups, and international groups that use the data. Scientists have cooperated with program managers in developing tools to help the public understand and use TRI data. Scientists spoke of the value of TRI.Net (designed for researchers), which allows people to conduct combine TRI data with other kinds of data overlays. Scientists are also providing enhanced tools to help the public to access hazard information related from a wide variety of sources (e.g., IRIS, CalEPA, and ATSDR) related to TRI chemicals. TRI.Net and TRI Explorer provide guidance on how to interpret information,

especially estimated TRI data. Scientists noted that another system, Envirofacts, allows users to compare TRI data with monitoring for national emission inventories. The user guide for the TRI Explorer describes these other information sources, but the TRI Explorer itself does not point to the National Emissions Inventories.

Scientists noted that EPA currently conducts limited internal data quality checks, because of the accelerated schedule for releasing TRI information. Current data quality checks only identify relatively huge outliers.

Staff discussed limited resources as a major barrier to science integration. When the TRI program was moved to the Office of Environmental Information, "we never were staffed up to level we've been supposed to." The program emphasis has been on information technology. The program currently has one toxicologist for all of its work. One interviewee stated "we're supposed to be doing science without scientists!" "We are utilizing contractors more." Scientists typically are constrained by using available IRIS information. Real integration is difficult, because most Agency science is driven by programs' mandates. The only toxicity information available might be a hazardous air pollutant assessment, but this information may be only of limited use to TRI.

On the positive side, staff noted a good budget for travel and training and the possibility of bringing on "young hires" with new knowledge.

The principal role for social science noted was for help with TRI communications. This need will grow if the TRI program moves in the direction of more community-based work.