



# CRESP UPDATE: SAVANNAH RIVER

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## **Cost Effective and Risk Protective Regulatory Advances: the Default versus Data Options**

By Charles Powers, Executive Director, CRESP

Default assumptions are what govern regulatory decisions when there is no reliable data on which to base the selection. Defaults usually refer to a number that specifies a contaminant level below which there is generically believed to be no or extremely low risks when specific information is not available. But default assumptions can also refer to regulatory policies or approaches that, in the absence of credible information about better ways to manage a specific problem conservatively sets requirements that, again, are virtually certain to prevent risk.

Hence, the term "default assumption" is one which good regulators hate to use to explain a regulatory decision. It is one which those who are regulated hate to hear because it means that the procedures and the costs of addressing a particular problem are almost certain to be higher. And the knowing public which is both being protected and, in the case of governmental cleanups, is paying the cost of cleanup, is equally disappointed when default assumptions govern either cleanup levels or cleanup approaches. Defaults are like a huge sign saying, we are protecting you at great cost because we don't know enough to choose something that is perfectly tailored to this situation and we are taking the precautions needed to be sure. And the process is then cleaning up less of the true risk for the funds available.

When cleaning huge sites, default assumptions are incredibly costly. One way of understanding what CRESP's research has been doing for the past four years is to see it as focused on replacing default assumptions with data. Not just specific data on specific projects, though Dave Kosson's, the Remediation Technology Task Group Leader at EOHSI, Update description of how CRESP and DOE and EPA researchers are exploring new techniques at the C-Burning Rubble Pit should yield important savings on that project ([See CRESP Update January 1999](#)). Instead, what is needed for the four or five most massive sites in the DOE complex is data that will allow the selection of policies that will allow the entire site to be seen holistically and to order priorities based on that data. And the good news is that we believe we are on the threshold of providing SRS and the DOE complex generally with information that will allow the regulatory and regulated entities to select policies that provide equal protection at dramatically reduced costs and far sooner than would be the case if the default procedures were used.

Do we know enough to establish cleanup levels on the basis of real data about the background levels of groundwater that enters the site so that the target of cleanup is what can actually be achieved in removing contaminants generated by the site? We think so. Otherwise, the alternative is to keep using default numbers. Do we know enough to begin to rely on biomonitoring data as a corroborating source of information about how contaminants are or are not moving within the sites? We think so. Otherwise, the alternatives are default monitoring assumptions or incredibly expensive site characterization processes. Do we know, or can we readily learn, enough about some portions of the big sites to conclude that with a modest effort, there is no additional cleanup required? We think so. Otherwise, the default assumption is that no part of a Superfund site is clean until the whole site is clean. If we could count the square miles where regulatory work is complete rather than only counting specific projects started or finished, the entire psychology of the regulatory process would be changed. In the months ahead, CRESP will be unveiling this vision of research that frees regulator and regulated alike to feel confident that the data is there to make many more decisions on the basis of information that replaces default assumptions. Science responsive to what concerns stakeholders have formed the pieces and this Update again records them; solving the puzzle of effective data-driven regulatory approaches is the broader vision of what CRESP was to help achieve. The twin goals remain real protection and cost-effective cleanup.

## **Ecological Health**

This Task Group continues with studies to 1) develop methods to assess the hazards and risks to organisms, populations, communities and ecosystems on the Savannah River Site and elsewhere, 2) understand the risk to humans and other consumers from wild fish and game, and 3) understand the perceptions of a wide range of stakeholders concerning ecological services, such as hunting and fishing. The projects at SRS are conducted in collaboration with scientists at the Savannah River Ecology Laboratory.

The Task Group is currently analyzing data collected at the Palmetto Sportsmen's Festival, where people were interviewed concerning the kinds and amounts of meats they ate in each month of the year. This will increase understanding of the role of wild game in both local culture and diet, and will provide information useful to risk assessors as well as managers interested in potential recreational uses at SRS. Preliminary data indicates that black people consume more meat than white people overall, and they consume more wild-caught fish than whites. However, white people consume more deer than black people.

People can eat three kinds of fish: store bought, restaurant, and wild-caught. The Task Group study found that people who eat the most fish eat mostly wild-caught fish. People who eat few meat and fish meals eat a higher proportion of those meals as fish than do people who eat a lot of meat and fish.

The studies of fish consumption patterns of people fishing along the Savannah River from the Augusta Lock and Dam to the Route 301 bridge are completed. To understand the risk from these consumption patterns, the Task Group is analyzing contaminants in several fish species collected from the Savannah River. The project includes analyzing a range of fish, including top level fish predators, and those consumed by people fishing along the river.

The Task Group is also working on the Oak Ridge DOE site to develop methods of evaluating the time patterns in ecological systems since the site was first established. Analysis of maps used from different time periods and photographs indicate that the major changes occurred in the first five years after facility construction, when the farmland was abandoned and had returned to forest and wetlands. A series of landscape measures show that the land at Oak Ridge is in a more pristine state than the surrounding countryside where human influences have continued to be felt since the site was constructed.

We are continuing this project to examine the landscape effects of different remediation scenarios, both in

time and space. These tools will be useful for future clean up and restoration phases. For information on any of the above projects, please contact Joanna Burger at [burger@biology.rutgers.edu](mailto:burger@biology.rutgers.edu) or at 732-445-4318.

## **Exposure Assessment and Remediation Technology**

Estimating the amount of chemicals and radionuclides that are widely spread out in the groundwater and that cannot be attributed to a specific source of contamination at SRS, or to background concentrations, is the focus of a joint project between the Remediation Technology and Exposure Assessment Task Groups at EOHSI. These concentrations are estimated at the maximum possible concentrations of chemicals and radionuclides at SRS prior to the commencement of production of nuclear materials. This information can help to identify appropriate targets for current cleanup and assist in determining the cost effectiveness of groundwater remediation options.

Members of the Remediation Technology and Exposure Assessment Task Groups recently met with representatives from Westinghouse and DOE to present the preliminary results. A report detailing the study is being finalized, and will shortly be submitted for scientific peer-review. For more information contact Amit Roy at [amitroy@fidelio.rutgers.edu](mailto:amitroy@fidelio.rutgers.edu) or at 732-445-7046.

## **Social, Land Use, Demographic, Geographic, and Economic (SLUDGE)**

The economic impacts of SRS on the region and prospects for future economic development were the topics of a major research project recently completed by Hank Mayer of SLUDGE. He studied the historical fluctuations in unemployment rates, income and types of industry in Aiken, Barnwell and Richmond counties over the past 45 years. Aiken was found to be most dependent on continued DOE funding of SRS and the most susceptible to downturns in employment at the site.

Detailed interviews with eighteen economic development experts and local officials from the three counties were conducted. These officials and community leaders discussed the impacts of the site and their attitudes toward the DOE and its contractors. The SRS region faces major obstacles to creating a more diverse economy, including the large number of high paying jobs that have to be replaced and the training of the local workforce. Due to a coordinated regional approach, Barnwell County has been successful in attracting industry. Aiken County has been successful in attracting the Bridgestone/Firestone plant. Local Aiken leaders also continue to lobby hard for continued employment at SRS. The interviewees noted that this may be a double-edged sword, insofar as it may ultimately deter other companies from locating in the area because they cannot compete with DOE for skilled workers at the same wage rates. Similar analysis of the regions surrounding the Hanford site in Washington and the Idaho National Engineering and Environmental Laboratory Task Group will build on some conclusions of Mayer's work. He will be examining the social, institutional and cultural factors that lead to regional growth. By pairing DOE regions (Savannah River, Oak Ridge and Hanford) with nearby non-DOE regions, important interactions peculiar to the DOE regions that either promote or inhibit growth will be uncovered. This work will identify key steps that local regions surrounding DOE sites may take in order to improve their prospects for regional development thereby reducing dependence on the DOE. Initial reports from this project should be available by Spring 2000. For more information, contact Karen Lowrie at [klowrie@rci.rutgers.edu](mailto:klowrie@rci.rutgers.edu) or at 732-932-0387, ext.577.

## **CRESP-University of Washington**

The CRESP-UW Data Characterization, Analysis and Statistics Task Group is working with the Institute for Evaluating Health Risks (IEHR) in Washington, DC, a CRESP partner, to review cleanup documentation at selected locations of the Hanford Nuclear Site. CRESP is interested in understanding how risk information is

developed and used in management planning and in determining that remediation goals are achieved. One project goal is to gain an experience base that may be generalized across other similar sites areas. CRESP has contacted Tribal Nations and stakeholders to solicit their views and interests on this project.

The University of Washington, CRESP and co-sponsors are hosting the Third Annual Conference on The Health of the Hanford Site, November 2-3, 1999 in Richland, WA. The conference goal is to provide a forum for people interested in Hanford to present research findings and discuss what should be done about the status of the ecological, community, and occupational health on the Hanford site.

The CRESP-UW Exposure Assessment Task Group has developed remote sensing techniques that offer the opportunity for real-time mapping of air pollutants and more comprehensive evaluations of risk to workers and others from gaseous emissions at Hanford and elsewhere. The method employed (Open-Path Fourier Transform Infra-Red spectroscopy, OP-FTIR) sends a long beam of infrared light up out through a contaminant plume, generating a light spectrum that provides information on the composition and concentration of substances in the plume. A disadvantage is that the highest levels of contaminants cannot be determined from standard OP-FTIR sensing data alone. The Exposure Assessment group has devised techniques to overcome this disadvantage by managing an array of reflectors at different distances and positions. A computer program is then developed to convert readings into a map of pollutant concentrations. The Task Group has taken the OP-FTIR into the field to monitor emissions from air exhaust stacks at Hanford "tank farms," which contain highly radioactive liquid waste. This technique may offer a cost-effective way to locate and identify emissions.

## CRESP

The Consortium for Risk Evaluation with Stakeholder Participation (CRESP) is a university-based national organization created specifically to develop a credible strategy for providing information needed for risk-based cleanup of complex contaminated environments, especially those for which the Department of Energy is responsible. The Consortium specifically responds to the request by the Department of Energy and the National Research Council for the creation of an independent institutional mechanism capable of integrating risk evaluation work. As a result of a national competition, a five-year cooperative agreement was awarded to CRESP in March of 1995. With the agreement of Citizens Advisory Board members, "CRESP UPDATE" is one approach that we are using to share research plans and programs with SRS stakeholders.

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**CRESP INFORMATION**

If you would like information about CRESP or any of the activities described, contact Lynn Waishwell, Director of Outreach and Communication at 732-445-0220. She would be happy to facilitate your dialogue with Task Group Leaders.

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