



S U P E R F U N D B A S I C R E S E A R C H P R O G R A M

Briefing Document

for the SBRP External Advisory Panel
2008-2009

SBRP External Advisory Panel Members

William H. Farland, PhD, Chair

Vice President for Research
Colorado State University

[*Bill.Farland@Research.ColoState.edu*](mailto:Bill.Farland@Research.ColoState.edu)

970-491-7194

Edward J. Bouwer, PhD

Professor
Geography and Environmental Engineering
Johns Hopkins University

[*bouwer@jhu.edu*](mailto:bouwer@jhu.edu)

410-516-7437

Teresa S. Bowers, PhD

Principal
Gradient Corp

[*tbowers@gradientcorp.com*](mailto:tbowers@gradientcorp.com)

617-395-5000

Johnnye Lewis, PhD

Director
Community Outreach and Education Program
New Mexico Center for Environmental Health Sciences
University of New Mexico

[*jlewis@cybermesa.com*](mailto:jlewis@cybermesa.com)

505-272-4186

David Nakles, PhD

Senior Vice President
AECOM Environment

[*dave.nakles@aecom.com*](mailto:dave.nakles@aecom.com)

412-717-9225

Martin Philbert, PhD

Professor and Associate Dean for Research
University of Michigan School of Public Health

[*philbert@umich.edu*](mailto:philbert@umich.edu)

734-763-4523

Nsedu Obot Witherspoon*

Executive Director
Children's Environmental Health Network

[*nobot@cehn.org*](mailto:nobot@cehn.org)

202-543-4033

*Member of NIEHS National Advisory Environmental Health Sciences Council

Helmut Zarbl, PhD

Professor

Environ and Occupational Health Institute
University of Medicine and Dentistry of New Jersey

zarbl@eohsi.rutgers.edu

732-445-2354

Lauren Zeise, PhD

Chief

Reproductive and Cancer Hazard Assessment Branch
Office of Environmental Health Hazard Assessment
California Environmental Protection Agency

lzeise@oehha.ca.gov

510-622-3195

NIEHS Superfund Basic Research Program Staff

Claudia L. Thompson, PhD

Acting Director

thomps1@niehs.nih.gov

919-541-4638

Beth E. Anderson, MA

Program Analyst

tainer@niehs.nih.gov

919-541-4481

Heather F. Henry, PhD

Program Administrator

henryh@niehs.nih.gov

919-541-5330

Kathy Ahlmark

Technical Information Specialist

ahlmark@niehs.nih.gov

919-541-7825

MDB, Inc. Support Staff

Elmer Akin, DrPH

eakin@michaeldbaker.com

770-422-7992

Maureen Avakian

mavakian@michaeldbaker.com

919-794-4701

Acronyms

ATSDR: Agency for Toxic Substances and Disease Registry

COC: Community Outreach Core

DNAPLs: Dense non-aqueous phase liquids

EAG: External Advisory Group (2003)

EAP: External Advisory Panel (2008)

ES & T: Environmental Science and Technology Journal

NAEHS: National Advisory Environmental Health Sciences

NIEHS: National Institute of Environmental Health Sciences

NIH: National Institutes of Health

ORD: Office of Research and Development

P42: Multi-project Grants

PCB: Polychlorinated biphenyl

R01: Individual Research Project Grants

R41: Small Business Technology Transfer Research grant, Phase I

R42: Small Business Technology Transfer Research grant, Phase II

R43: Small Business Innovation Research grant, Phase I

R44: Small Business Innovation Research grant, Phase II

RFA: Request for Applications

RPM: Remedial Program Manager

RTC: Research Translation Core

SARA: Superfund Amendments and Reauthorization Act

SBIR: Small Business Innovation Research

SBRP: Superfund Basic Research Program

STTR: Small Business Technology Research Transfer

US EPA: United States Environmental Protection Agency

Table of Contents

1. Introduction	1
2. Goals, Rationale and Charge to the Panel.....	3
3. The Deliberative Process and Report Preparation.....	5
4. Formation and Brief History of SBRP.....	7
5. Scientific Philosophy and Goals	11
6. Science Development and Oversight.....	13
7. Communication Tools.....	17
8. Closing Comment	21

Appendix A: Grant Funding History

Appendix B: Current Grantees

Appendix C: Examples of Notable Research Advances

Appendix D: SBRP–funded Activities at Hazardous Waste Sites

Appendix E: Research Translation Core Activities

Appendix F: Executive Summary: 2003 External Advisory Group Review

Appendix G: Risk e Learning Web Seminars

Appendix H: SBRP–funded Conferences

1. Introduction

We welcome you to the Superfund Basic Research Program (SBRP) of the National Institute of Environmental Health Sciences (NIEHS). It is indeed our pleasure to have you participate on this distinguished external panel, become familiar with our research, outreach and training program and to provide advice on its future direction. We thank you for your time and the application of your expertise and perspective to this endeavor.

Each of you were selected to serve on our External Advisory Panel (EAP) because of your knowledge and familiarity in areas important to the SBRP. You, as a member of the EAP, are asked to focus your deliberation and recommendations on the future Program, i.e., what changes, if any, should be made in its direction, emphasis, or approach for conducting basic research, science communication, and outreach in achieving program goals. Your findings will be documented in a report that we will use in developing a framework for the future direction of the Program.

The EAP is a working group of the National Advisory Environmental Health Sciences (NAEHS) Council. Dr. William Farland is the chair of the Panel and Ms. Nsedu Obot Witherspoon is the Council representative.

The intent of this Briefing Document is to provide basic information on essential aspects of the Program as you prepare for the deliberation meeting in January. Three conference calls will be held before the January meeting to augment the information in this document and to assist in planning and preparation for that meeting.

Subsequent sections provide information on:

- The Goals and Charge to the Panel
- The Deliberative Process and Report Preparation
- Formation and Brief History of SBRP
- Scientific Philosophy and Goals
- Science Development and Oversight
- Communication Tools

Appendices to this Briefing Document provide additional information on many of the section topics above.

Page intentionally left blank.

2. Goal, Rationale and Charge to the Panel

Goal Statement

The goal of convening the Superfund Basic Research Program External Advisory Panel is to provide the SBRP staff input for the development of a framework for the future direction of the Program.

Rationale

As we plan for the future, we want to ensure that the SBRP remains responsive to its mandates and fosters an environment to (1) address both current research needs and emerging issues pertaining to hazardous substances in the environment, (2) attract researchers conducting the best and most cutting-edge science and (3) proactively accelerate the use of the science emanating from the Program. To assist us in developing a framework to meet these objectives, we have invited you to serve as an independent panel of external peers. Your deliberations should consider input from SBRP grantees, its federal partners and other stakeholders.

Charge to the 2008 SBRP External Advisory Panel

Your charge is to provide the SBRP with independent analyses and recommendations to the following four interconnected questions:

1. What are the key, fundamental scientific issues that should frame the SBRP research enterprise?
 - Examples: Research to reduce the uncertainty of risk assessment; research on emerging technologies for site remediation
2. What are the emerging issues that the SBRP should anticipate and incorporate into future initiatives?
 - Examples: Climate change; nanotechnology as a remediation tool; nanoparticles as potential toxic contaminants
3. How can the SBRP best support the acceleration of the basic science into application?
 - a. What structures best support this at the grantee level?
 - » Example: Research translation core vs. other models
 - b. What can we do as program managers to facilitate this process?
 - » Example: Conference/workshops, federal partnerships, etc?
4. What activities and relationships would suit the objectives stated in the rationale?
 - a. Is the current balance of Multi-project (P42), Individual Research Projects (R01) and SBIR/STTR (R41,R43) grants appropriate?

- b. Are new structures needed to support data sharing and research collaborations among the SBRP grantees?
- c. Is there a role for conferences/workshops to support SBRP programmatic goals? Are there other formats that would enhance the utility of these efforts?
- d. What role should Community Outreach play: is it vital to the success of the program and should it be continued?

The summation of your deliberations and analysis will be a report.

3. The Deliberative Process and Report Preparation

Dr. Farland, the Panel Chair, will guide you through the deliberative process, as outlined below, and will oversee the development of the final report.

(a) November 3rd (3:30 PM—EST): A Conference Call of Panel Members and SBRP Leadership led by the Chairman.

This call will be a brief walk-through of the Briefing Document and provide a time for questions and answers. **You should be fairly familiar with the contents of the Briefing Document in order to ask any clarifying questions.**

(b) December (date to be determined): A Conference Call of Panel Members led by the Chairman.

The purpose of this call will be for the Chairman to lay out his plan and process for the panel meeting and to initiate discussion on the development of a report to summarize the panel's findings and recommendations. **Any request for additional background information or resources should be made at this time.**

(c) January 5th (3:00 PM—EST): A Final Conference Call of the Panel Members led by the Chairman.

The purpose of this call, held about two weeks prior to the onsite meeting, will be for the Chairman to discuss and identify responsibilities of each panel member and to help you "hit the ground running" at the meeting.

These conference calls are key components of the EAP deliberative process and it is anticipated that all panel members will participate in each call.

(d) January 19–21, 2009: Face to Face 2.5-day Meeting of the Panel held in Suite 106, 100 Capitola Drive, Durham, NC. The meeting will begin at 10:00 AM (EST) on Monday the 19th.

The purpose of this meeting will be for the panel to develop a consolidated response to the EAP's charge. Time will be allotted for the panel to ask clarifying questions of Program staff and stakeholders,

The first day of the meeting will be devoted to presentations by SBRP staff and different stakeholder groups. Stakeholder groups will include: (1) SBRP grantees, (2) community interest and (3) environmental consulting firms. The Tuesday meeting will begin with presentations from United States Environmental Protection Agency (US EPA) and Agency for Toxic Substances Disease Registry (ATSDR), who are the major federal partners of the Program.

All presentations are meant to provide the panel information and perspective beyond that provided in the briefing document. Question and answer periods will follow each presentation and you are encouraged to take full advantage of these periods as these groups have a vital interest in and/or history with the Program. Materials prepared by these groups will be provided to the panel prior to the meeting.

The Tuesday afternoon and the Wednesday morning sessions will be set aside for panel deliberations and report writing. These sessions will be closed; however, NIEHS staff will be available if needed. Tuesday afternoon, the Chairman will outline the sections of the report and identify key points. You will be given the opportunity to initiate writing your sections during this period. On Wednesday morning, time will be allotted for each panel member to discuss the recommendations made in his or her section of the report and to complete writing assignments. If you need additional time and/or resources, the section should be completed and e-mailed to the chairman within two weeks of the close of the meeting.

The final editing of the draft report will be the responsibility of the Chairman. The panel members will have an opportunity for comment prior to the draft being submitted to the SBRP Director on March 1, 2009. The Chairman will evaluate any comments made by the panel and the SBRP Director and will respond as he deems appropriate. The final report is to be submitted to the SBRP Director by March 30, 2009. A copy with signed cover letter will be submitted to the NAEHS Council and Dr. Farland and Ms. Obot Witherspoon will present the panel's finding at the May 2009 Council meeting. The report will be used internally by NIEHS as guidance in developing the future direction of the Program. It may be distributed to a wider audience including its posting on the Institute's website.

4. Formation and Brief History of SBRP

The NIEHS's SBRP was created under the Superfund Amendments and Reauthorization Act (SARA) of 1986. The major provisions of the statute called for a university-based basic research program that sought the development and advancement of:

- Techniques for detection, assessment, and evaluation of the effects on human health of hazardous substances; epidemiological studies may be included
- Methods to assess the risks to human health and ecological receptors by hazardous substances
- Methods and technologies to detect hazardous substances in the environment and basic biological, chemical and physical methods to reduce the amount and toxicity of hazardous substances

In response to the SARA legislation, the NIEHS undertook the development of a research program that would encompass the broad mandates outlined in the statute. The Program seeks to fund research that complements the interest and activities of the Superfund programs in the US EPA and the ATSDR. SBRP considered appropriate areas of study to include biomedical, ecology, epidemiology, toxicology, molecular biology, hydrogeology, engineering and soil science. Over its 20-year history, SBRP has developed a unique program for the support of basic environmental health research that addresses the science issues posed by abandoned and uncontrolled hazardous waste sites around the country. The SBRP managers are using three different grant mechanisms to support the Program's research (1) university-based Multi-project Grants, (2) university-based Individual Research Project Grants and (3) Small Business Innovation Research (SBIR) and Small Business Technology Transfer Research (STTR) grants. Approximately 94% of SBRP's annual budget goes directly to the funding of these research grants. All grant applications are peer-reviewed and awarded through the NIH competitive process.

The Multi-project Grant program (P42) has been the mainstay of SBRP since the first awards were made 1987. These grants enable teams of scientists from different disciplines to address complex hazardous waste problems from multiple perspectives. Each project within a Multi-project Grant is evaluated by the peer-review process; thus each project has significant scientific merit on its own. The objective of using this grant mechanism is to establish and maintain a unique program that links and integrates biomedical research with related non-biomedical components. Through this

grant mechanism, SBRP also has been proactive in developing outreach, training, and technology transfer initiatives.

The Multi-project Grant portfolio has experienced significant growth since its inception when, with a budget of \$3M, it competitively awarded four university-based grants, each for five years. Increases to the SBRP appropriation allowed the Program to grow to its maximum number of 19 grants in 1995-2000. Since 2004 the budget has had little growth and currently the Program supports only 14 of these grants with an annual budget of approximately \$41M.

This Program is quite competitive and has resulted in a continual turnover of the grantees (e.g., between the period of 1990 and 2000 there was a 1/3 turnover.) The success rate in 2005, 2006 and 2008 was 48%, 19% and 12.5%, respectively. Eleven applications were received in 2008 and are under review. Appendix A provides a Gantt diagram of the history of Multi-project Grant program.

The Individual Research Project Grants (R01) were initiated with the funding of pilot grants in 2006 and, subsequently, two Requests for Applications (RFAs) have been released. Funding is for discrete, single projects focused to meet high-priority research needs of the national Superfund Program or tackle issues of emerging concern. The first RFA encouraged research to develop innovative approaches to address the remediation of contaminated sediments, with particular emphasis on in situ remedies. The second was to enhance our understanding of the basic structural and functional properties of microbial populations that are involved in the remediation/sequestration of hazardous substances by integrating or adapting innovative nanotechnology-based tools for sensing, detecting, and elucidating processes at the molecular and nano-scale. Under this mechanism, we currently fund seven sediment grants and will fund four nanotechnology-based grants beginning in 2009. The annual budget for this program is approximately \$2.5 M.

SBRP's SBIR and STTR (R43, R44 / R41,R42) grant program was established to foster the application and commercialization of innovative monitoring and remediation technologies. Grant opportunities are announced via the NIH Omnibus solicitation triannually. SBRP provides Phase I and Phase II funding to small companies applying biotechnology and bioengineering approaches for the development of novel strategies that can be used to characterize and monitor contaminants at waste sites, and to reduce exposure via remediation technologies. SBRP also supports Phase I and Phase II research to improve monitoring capabilities to assess and characterize the extent

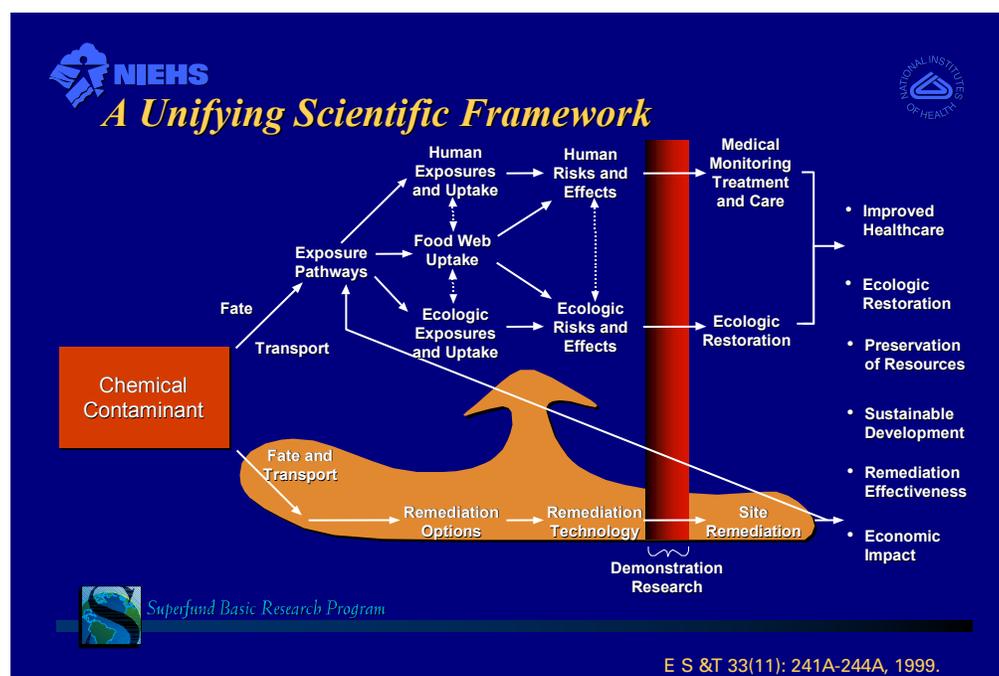
and amount of contaminants present at sites, as well as to monitor the effectiveness of remediation technology in reducing the amount and toxicity of contaminants. This activity was initiated in 2001 at the federally mandated level of 2.8% of the budget (approximately \$1.3M). We currently fund two Phase I and three Phase II SBIR/STTRs.

Appendix A presents timelines that chronicle the growth of the SBRP, and depict the grantees that have been part of the program during its history. For a better appreciation of the breadth of the science supported by the SBRP, Appendices B and C provide information on the current SBRP grants and recent research advance, respectively. The SBRP website (<http://www.niehs.nih.gov/sbrp>) provides in-depth information on the research, outreach, and training funded since 1995.

Page intentionally left blank.

5. Scientific Philosophy and Goals

At the onset, NIEHS leadership envisioned the SBRP to be a program of basic research that would include the traditional NIH biomedical research projects plus non-biomedical projects (e.g., hydrogeology, fate and transport, geochemistry, ecology). The philosophical basis for creating an integrated program is reflected in the figure below. This diagram illustrates how environmental health research, as it pertains to issues confronting hazardous wastes, follows three interconnected pathways from exposure and fate and transport to its effects on the environment, ecosystems and human health. Based on this conceptualization, we determined that the SBRP should foster integrated multidisciplinary research that encompasses the science depicted to the left of the red bar. We believed this to be the best approach for addressing the broad and complex health and environmental issues posed by hazardous waste sites throughout the United States. Accordingly, in 1987 we created the Multi-project Grant program.



While founded on the premise that basic research was needed to provide the scientific underpinning for understanding, prioritizing and addressing environmental and health issues, the NIEHS leadership also recognized that the research program could not be solely of academic interest. It must penetrate the red bar in order to be responsive to the objectives and needs of its governmental partners (US EPA and ATSDR), to have real-world orientation with relevance to the nation's environmental contamination issues and to work towards finding practical applications to its basic research findings. To accelerate the attainment of these goals, we have been supportive of numerous technology transfer opportunities by providing seed funds to promising innovative

technologies. Since the beginning of the Program we have encouraged the Multi-project Grantees to develop outreach and educational activities directed to communities affected by hazardous waste sites. We have been supportive of grantees working at hazardous waste sites (Appendix D). Most recently we have required each Multi-project Grant to include a Research Translation Core to ensure that all research advances are being optimized. Appendix E presents examples activities conducted by the Research Translation Cores.

In addition, SBRP is also strongly committed to the development of future scientists by supporting graduate level cross-disciplinary training in fields related to environmental health. Students pursuing degrees in the non-biomedical areas are encouraged to place their studies in the context of environmental health sciences and biomedical research. Likewise, students of the biomedical sciences should have cross-training opportunities in the non-biomedical areas of study. In addition to providing students with unique opportunities in interdisciplinary research, the SBRP also encourages students to gain experience in communicating research outcomes to diverse audiences.

Given these as our overarching philosophies, the SBRP staff has identified several areas critical to our research, outreach and training mission:

- Protecting human health and the ecosystem
- Reducing the uncertainty in determining environmental health risks
- Improving cleanup strategies and developing alternative remediation technologies
- Developing innovative detection and monitoring devices
- Contributing to the elucidation of environmental exposure and disease relationships
- Conducting research translation and community engagement
- Fostering multi/interdisciplinary training of the next generation of investigators

6. Science Development and Oversight

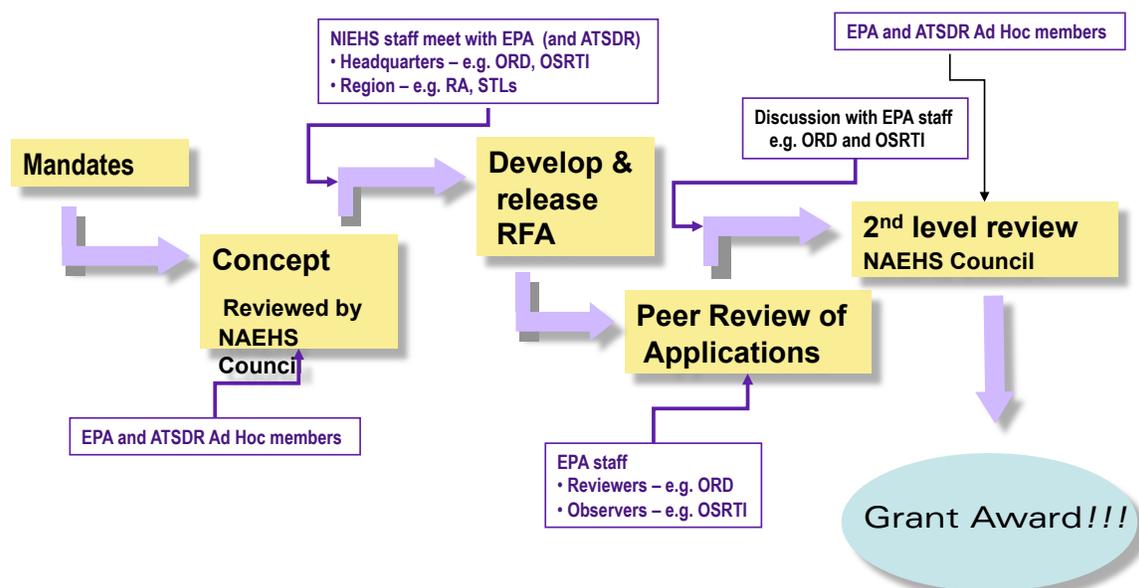
RFA Development and Peer-Review Process

Successful programs start with ensuring that only the most scientifically meritorious and programmatically relevant applications are identified and supported. This hinges on quality peer-review and program management. One of the considerations in establishing the SBRP at NIEHS is that it uses the highly regarded NIH competitive peer-review process. For the Multi-project Grants and the Individual Investigator Grants, NIEHS staff, with input from federal partners, initiates this process with the preparation of a Request for Application (RFA). The SBIR/STTR process begins with staff preparing research needs to be included in the annual NIH Omnibus solicitation for SBIR/STTR grants.

The subsequent steps that are involved include:

- Publication of the RFA/NIH Omnibus solicitation in the NIH Guide to Grants and Contracts
- Submission of grant applications
- Performance of a scientific peer-review
- Solicitation of input from US EPA and ATSDR (specifically for the Multi-project Grants and Individual Investigator Grants)
- Performance of a second level review by the NAEHS Council
- Award of the grant(s) by NIEHS

NIH Peer-Review Grant Award Process



In the development of an RFA, the NIEHS wants to be certain that the applicants have access to, are aware of, and consider the most relevant basic research needs of SBRP clients in preparing their submissions. Because the SBRP is a basic research program, it places emphasis on hypothesis-driven research. However, the scientific needs of “end users” frequently require more practical research information. Therefore, applicants are encouraged to include research approaches that address the users’ data needs. The NIEHS over the years has established a mechanism of surveying the scientific community for identifying cutting edge science and critical gaps in the various disciplines through its sponsorship of workshops and conferences. In addition to this, NIEHS seeks to solicit advice and recommendations from environmental regulators and public health protection officials, scientists and engineers. The intent of querying stakeholders prior to developing an RFA is to learn of their data needs and to aid in providing prospective grant applicants with an extensive list of suggested areas of research. It is also intended to develop a heightened level of partnership between NIEHS and its Superfund research clients.

Applications that are complete and responsive to the RFA undergo the competitive NIH-established peer-review process. Applications are evaluated and scored by scientific and technical experts who have the necessary proficiency to adequately review the science. With regard to the Multi-project and Individual Research Project Grants, after the initial review, US EPA and ASTDR are offered an opportunity to provide comments on the scored applications. The NAEHS Council conducts the second-level review on all scored applications whereby it evaluates the adequacy and appropriateness of the initial review process and makes recommendations to the Director of the NIEHS. Ultimately, the criteria that NIEHS uses for the award decision include: (1) scientific merit, (2) availability of funds and, (3) programmatic priorities.

Ongoing Oversight

The review and oversight of funded proposals does not stop with peer-review of the application. External reviews of the science direction and accomplishments have been an integral and ongoing component of the Program as a whole as well as of each individual program. For example, each Multi-project Grantee constitutes its own external advisory board that convenes at least annually. On another level, the SBRP believes that periodically an external team of experts should have an opportunity to comment on the Program. An External Advisory Group (EAG) was assembled in 2003 to conduct a full program review (see Appendix F for the Executive Summary). Now this External Advisory Panel is asked to provide advice on the future direction of the Program.

Internal review also occurs throughout the life of the grant and on multiple levels. Grantees use internal advisory boards to evaluate the progress of their projects. At the Program level, all grantees are required to submit annual progress reports. Periodically Program staff visit grantees to discuss both problem areas and significant advances.

Another mechanism used to ensure that the Program is “on track” and meeting the goals of our Superfund partners, is that SBRP staff has established strong relationships within US EPA and ATSDR. Having established liaisons within each agency we are better able to coordinate research agendas and are able to solicit their input in the development of our RFAs and in the selection of grantees.

Page intentionally left blank.

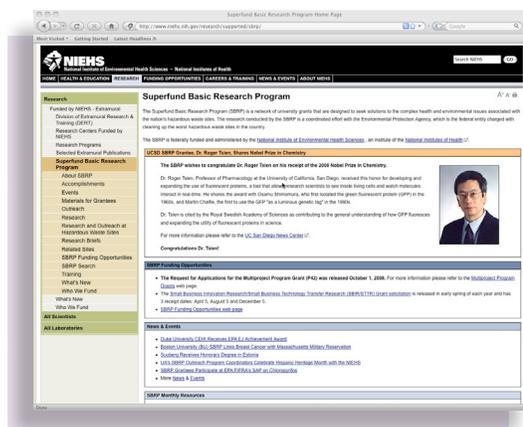
7. Communication Tools

Communication of the findings and activities funded by the Program is a critical effort and an enormous challenge. The challenge lies in that fundamental basic research does not lend itself to simple communication tools. Adding to the complexity is that, while SBRP's primary stakeholders are environmental health officials at US EPA and ATSDR, the Program also strives to reach a broader, more diverse audience including academia, not-for-profit and community organizations, engineering and consulting firms and the general public.

Accordingly, the SBRP employs a wide range of communication strategies based on collection and analysis of grantee research findings and activities and stakeholder needs. SBRP's communication tools are tailored to the message and the target audience and include preparation and distribution of print materials and electronic documents, maintenance of a comprehensive web site, web seminars, and planning and participation in national conferences.

(a) **Website.** The SBRP website, <http://www.niehs.nih.gov/sbrp>, is a detailed but user-friendly resource on all aspects of the historical and current research program. The information is organized and written to provide easy access to both technical and general public audiences. The site presents:

- Summaries and progress reports for all research, research translation and outreach activities
- Success stories highlighting research and outreach activities
- Publication and patent information by project and year
- SBRP Research Briefs
- Calendar of conferences and seminars
- Resources for SBRP-funded students as well as pages highlighting student successes
- Information on funding opportunities



Navigation within the site is simplified by the menus on each page and by two important search tools:

- The SBRP Search Tool (<http://tools.niehs.nih.gov/sbrp/search/index.cfm>) allows users to search the entire database supporting the web site – for people, projects, or specific words.
- The Research Pages (<http://www.niehs.nih.gov/research/supported/sbrp/research/index.cfm>) allow users to search for research projects relevant to specific topics. SBRP identified 14 topic areas and categorized each research and outreach project to facilitate searches.

(b) Research Briefs. Since 1997 SBRP has created and distributed electronic documents highlighting significant research advances. The Research Briefs are well-received as is evidenced by the comments from readers and by the continued increase in subscriptions to the mailing list. Readership has increased from approximately 900 in 2000 to over 5,100 in September 2008. Over half of the Research Brief subscribers are EPA employees, many of whom forward the documents to their co-workers.

The Research Briefs are indeed useful--concise and clearly written. They are a helpful reminder of why we do what we do to address hazardous waste sites and a good indicator of what the future may hold as this scientific information leads to changes in policy and law. Thanks for doing it.

Ellie Hale, RPM, EPA Region 10

The monthly Research Briefs provide context for the research, highlight recent findings, and discuss the significance of the work. The documents are targeted to a technical audience, but present background information and translate the science into user-friendly language so that readers “outside the field” can understand the work and its potential impact. Each Brief provides citation information for relevant publications and the researcher’s contact information so that readers can easily access additional information. Research Briefs for 2007 and 2008 are presented in Appendix C.

(c) Risk e Learning. In 2002, SBRP partnered with EPA to establish a series of web-based seminars, “Risk e Learning”. SBRP interacts with representatives of EPA ORD to identify topics for each seminar series and works in cooperation with EPA’s online training website (CLU-IN.org) to conduct the seminars. These partnerships ensure that the seminars are relevant to the target audience and provide SBRP

Topics addressed to date include bioavailability, biosensors, DNAPLs, metals, nanotechnology, PCBs, and phytoremediation.

with access to the EPA web seminar system and the TechDirect newsletter, which announces the seminars to over 20,000 readers. The SBRP-supported seminars have consistently been among the more well-attended sessions on the CLU-IN web site. A complete list of Risk-e-Learning seminars is presented in Appendix G.

(d). Conferences and workshops. The SBRP provides funding for eight to twelve conferences each year. This strategy allows the Program to disseminate SBRP-funded research findings to relevant stakeholder groups, identifies areas of research needs and provides opportunities for grantees to interact with other experts in their field and with stakeholders at US EPA and ATSDR. SBRP supports conferences organized by grantees and collaborates with other agencies and institutions to jointly sponsor conferences and workshops. In addition, SBRP supports an annual meeting of its grantees.

A list of SBRP-funded conferences is presented in Appendix H.

Page intentionally left blank.

8. Closing Comment

In preparing this document, SBRP staff and its support contractor sought to develop a succinct compilation of information to cover the essential elements and the philosophy of the Program. Out of respect for your time, our goal was to provide you with only the most necessary resources to aid in addressing the charge put before you. However, if there is any additional information we can provide to make this task easier, please do not hesitate to ask.

We very much look forward to discussing the Program with you on the November conference call and at our January meeting and to receiving your written report. Again, thank you for your time, your considered opinions and recommendations in shaping the future direction of the Superfund Basic Research Program.



MDB, Inc.

100 Capitola Drive, Suite 308
Durham, NC 27713

T: (919) 794-4700

F: (919) 287-2901

www.michaeldbaker.com

info@michaeldbaker.com