

Report of NABIR Subcommittee of BERAC
June 21-22, 2001 meeting at AGU, Washington D.C.

Review of the BASIC Element of the NABIR Research Program

BASIC Program

The BASIC program has the overall objective of identifying the critical societal, cultural, legal, policy and regulatory issues related to the use of bioremediation at DOE sites and promoting a dialog and greater understanding of the implications of these issues among the scientific, regulatory and general public sectors. The focus is on in situ bioremediation of metals and radionuclides. The program consists of six research projects under the general topics of identification of stakeholder concerns, improved communication, societal acceptability of bioremediation, and genetically engineered organisms. The review consisted of an overview of the BASIC element by the program manager and presentations of two projects representing original parts of the basic program.

Findings and Recommendations on the BASIC element of the NABIR program:

The general issues being addressed by BASIC are clearly important to implementation of any new technology, and it is appropriate to consider these issues in the context of a DOE Office of Science research program designed to facilitate the development and application of bioremediation technologies. However, it appears that the BASIC program, which was originally intended to be part of a much larger NABIR program that did not materialize, now needs to better define and articulate research priorities and objectives that are commensurate with the NABIR scientific effort and the resources currently available. With the exception of a project that is largely focused on the NABIR field research center, there is not a clear relationship between the BASIC program and the overall NABIR research strategy, which has evolved with scientific discovery and budget constraints and now focuses on specific contaminants and immobilization processes.

The committee reviewed the BASIC element with respect to the following four questions posed by Dr. Jerry Elwood:

1. How can BASIC studies be better integrated with those in other NABIR program elements to ensure that the funded investigators are cognizant of and benefit from work in other NABIR program elements and vice versa?

The committee concluded that the level of integration of BASIC studies into other NABIR elements could be improved by clearly articulating the BASIC objectives and priorities to the funded investigators. The committee strongly recommended that the BASIC element should focus on the societal and regulatory issues associated with biologically mediated radionuclide/metal immobilization versus the general topic of bioremediation. Experience at DOE sites where chemical immobilization

technologies have been tested indicate that there are significant public perception and regulatory concerns centered specifically on immobilization technologies, such as the longevity of in situ permeable barriers, the need for retreatment, and the potential mobility of a concentrated pulse of contamination off site if the barrier fails. These issues are likely to have a much larger impact on the ability of DOE to address radionuclide/metal contamination than issues commonly associated with bioremediation (i.e. injection of nutrients or bacteria). The DOE SubCon Focus Area group was suggested as a source of information on issues associated with immobilization technologies and as potential partner for the program.

An important part of improving communication between basic scientists and scientists in the other NABIR program elements will be recognition of the important differences in research methods and approaches used by these two groups. For example, the lack of numerical data and standard scientific approaches for interpreting the data in the BASIC presentations contributed to difficulties in evaluation of the success of the effort by this committee. BASIC may wish to consider how to bridge gaps of this type for better integration with other NABIR program elements.

2. What should be the primary focus and priorities of BASIC to match the limited resources and support the overall goals and objectives of the NABIR program?

The general goals and objectives of the NABIR program can best be supported by refocusing the BASIC element on issues associated with radionuclide/metal immobilization. Furthermore, there is a need to articulate the specific goals and expected products of research conducted by the basic program and to outline a pathway and time lines for achieving them. The BASIC element could maximize its impact by clearly focusing efforts on the following customers: NABIR scientists, NABIR program managers and DOE Office of Science and Technology.

3. How can we encourage a broader community of scholars with interests relevant to BASIC to apply for BASIC grants?

To attract a broader community of scholars to the BASIC program, the intent of the BASIC program, the relationship of BASIC to NABIR, and the underlying science involved in the immobilization of radionuclides must be clearly defined and communicated. This will provide future investigators with the technical substance needed to develop refined approaches to address regulatory and societal issues. There was a perception that investigators who presented their projects in this meeting were struggling with how to define their role in the BASIC program and this led, in part, to problems in communicating their objectives and approaches to the committee. As a first step in focusing BASIC, the committee suggests that a data collection effort be supported to identify existing societal and regulatory issues associated with radionuclide immobilization technology and the current processes for addressing these issues, including the special role played by the DOE sites and clean up contractors in incorporating new technology into environmental restoration. This data

could then be provided to leaders in the social science field who would help draft clear questions for a Request for Proposal (RFP). This strategy would improve the clarity of a BASIC solicitation and hopefully improve the quality and quantity of responses received from the social science community.

In conjunction with the direct involvement of social scientists in helping formulate the BASIC program element, the scientists involved in other elements of NABIR should be encouraged to bring the BASIC program to the attention of qualified social scientists within their networks. Through this process, investigators representing the broad spectrum of disciplines represented in the NABIR program would begin to have a stake in each other's research. This mutual interest/connection across biological and social science boundaries was notably absent in the presentations and material provided to the committee.

Is the current set of topics and activities supported by BASIC appropriate or are there things BASIC should be supporting that it currently is not?

It is appropriate to address societal concerns within a scientific program and clearly the BASIC element has the potential to add value to NABIR, which may provide the foundation for new, perhaps even controversial technologies. The general areas of research identified in BASIC appeared to encompass the range of issues likely to be encountered in developing and deploying bioremediation technology. However, the rationale for selection of the original projects in BASIC was not clear, nor was it apparent that the research is systematically evolving with new information developed in BASIC and the other NABIR program elements. It is important that BASIC establish specific objectives and priorities that are closely tied to the NABIR strategy, and that a hierarchy of types of societal research be established and followed. Such a hierarchy would begin with development and use of survey instruments to better define the problem/concern.

In summary, the committee recommends that the current set of topics addressed by the BASIC element be examined based on the refocusing of NABIR scientific research on immobilization and that the relevant regulatory and societal issues be identified. From a review of the abstracts of these projects, it would appear that the general principles being addressed are appropriate but that additional focus and refinements in scope and direction would be required if BASIC efforts were tied specifically to the revised NABIR strategic plan.

Signed for the Committee

James M. Tiedje, Chair, August 1, 2001

Members present:

Linda Chrisey

Derek Lovley

Joe Suflita
Catherine Vogel
David White
Ray Wildung
John Zachara
Peter Siebach, special member
Joseph McInerney, special member