Department of Energy
Office of Science
Washington, DC 20585

July 23, 2003

Office of the Director

Dr. Keith O. Hodgson
Director, Stanford Synchrotron Radiation Laboratory
Department of Chemistry
Stanford University
Stanford, CA 94305

Dear Dr. Keith Hodgson:

As part of the Idaho National Engineering and Environmental Laboratory's (INEEL) Subsurface Science Initiative (SSI), a major research undertaking aimed at expanding the understanding of subsurface contaminant fate and transport, INEEL has proposed the construction of a specialized Subsurface Geosciences Laboratory (SGL). The SGL would house mesoscale experiments intended to link traditional laboratory experiments with field-scale observations. The mesoscale experiments would be conducted at scales large enough to allow evaluation of the field-relevant coupled processes.

The SSI and SGL were initiated at the time that INEEL was designated as the "Lead Laboratory" for the DOE Office of Environmental Management (EM), and that Office was responsible for management of INEEL. In FY 2003, management of the INEEL was transferred to the DOE Office of Nuclear Energy (NE), and NE has requested that the Office of Science conduct a review of the need for mesoscale experiments or facilities.

To assist us in this assignment, I am asking the Biological and Environmental Research Advisory Committee to organize and oversee a review of the scientific basis and need for the proposed SGL facility. More specifically, the review should address the following questions:

> Is there a scientific need for the experiments at the mesoscale? What specific scientific issues require such experiments for their resolution? What are the advantages and limitations of mesoscale experiments? Are there alternative ways to achieve the same goals?
>
> What kind of experimental capabilities and facilities would be required to address these issues? Are there existing facilities with these or similar capabilities, and if so, what kind of results have they achieved.

- Will the facility being planned at INEEL be capable of addressing the scientific needs identified above? Are there plans in place for the operation and management of the facility? If so, are these plans appropriate and adequate?
- Is INEEL the appropriate site for the facility? Does INEEL have the appropriate scientific infrastructure (facilities, workforce, and related programmatic work) to support successful research at the facility?

  Would investing in this facility now be timely and appropriate for DOE? If not, is there a need for further assessment of the potential uses, limitations and strengths of the proposed facility compared to other existing or potential facilities?

I would like the review to be conducted in late January 2004, with a draft report to me by April 1, 2004. I would like to have a final report from BERAC prior to but no later than the Committee's Spring meeting.

Thank you and your Committee for your continuing help and support in advising the DOE on its research directions and plans.

Sincerely,

Raymond L. Orbach
Director